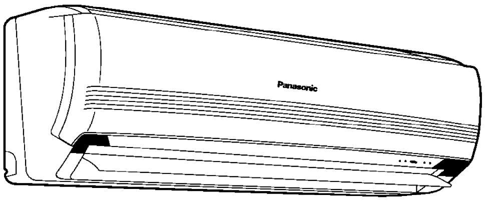
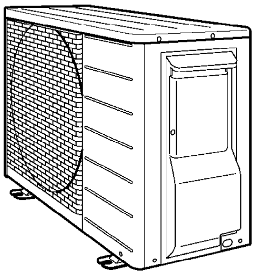
Order No: RAC0209005C2

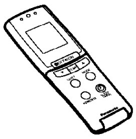
Service Manual

Room Air Conditioner

CS-ME7CKPG / CS-ME10CKPG / CS-ME12CKPG / CS-ME14CKPG / CS-ME18CKPG / CU-2E15CBPG / CU-2E18CBPG / CU-3E23CBPG / CU-4E27CBPG







© 2002 Matsushita Electric Industrial Co., Ltd. All rights reserved.
Unauthorized copying and distribution is a violation of law.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

⚠ PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigeration circuit.

1. Features

- Product

- A single OUTDOOR unit enables air conditioning of up to four

separate rooms

CONNECTABLE INDOOR UNIT / OUT DOOR UNIT	ROOM	CS-ME7CKPG	CS-ME10CKPG	CS-ME12CKPG	CS-ME14CKPG	CS-ME18CKPG	Capacity rannge of connectable indoor units	Pipe length				
								1-room maximum pipe length m	Allowable elevation m	Total allowable pipe length m	Total pipe length for maximum chargeless length m	Additional gas amount over chargeless length g/m
CU-2E15CBPG	A	◎	◎				From 4.4 to 5.0 kW	20	10	30	20	20
	B	◎	◎									
CU-2E18CBPG	A	◎	◎	◎			From 4.4 to 6.4 kW	20	10	30	20	20
	B	◎	◎	◎								
CU-3E23CBPG	A	◎	◎	◎	◎	◎	From 5.0 to 10.0 kW	25	15	50	30	20
	B	◎	◎	◎	◎	◎						
	C	◎	◎	◎	◎	◎						
CU-4E27CBPG	A	◎	◎	◎	◎	◎	From 5.0 to 13.6 kW	25	15	70	40	20
	B	◎	◎	◎	◎	◎						
	C	◎	◎	◎	◎	◎						
	D	◎	◎	◎	◎	◎						

- Inverter controlled for High energy efficiency and optimal comfort
- E - scroll compressor - guarding against global warning
- New refrigerant R410A is used for protecting ozone layer
- Recyclable design - non foamed polystyrene packing, lead - free P.C. Board
- Quiet - running OUTDOOR unit
- Luminous remote controller
- Quiet mode
- Powerful mode
- Sleep timer (7-hour delay off)
- Odour wash
- 24-hour on & off real setting timer
- Serviceability
- Self diagnosis
- Test Run at both Cooling and Heating rated frequency
- Test Run at both of INDOOR and OUTDOOR unit’s
- Quality Improvement
- Abnormal wiring or piping connection detection

2. About Lead Free Solder (PbF)

2.1. DISTINCTION OF PbF P.C. BOARD

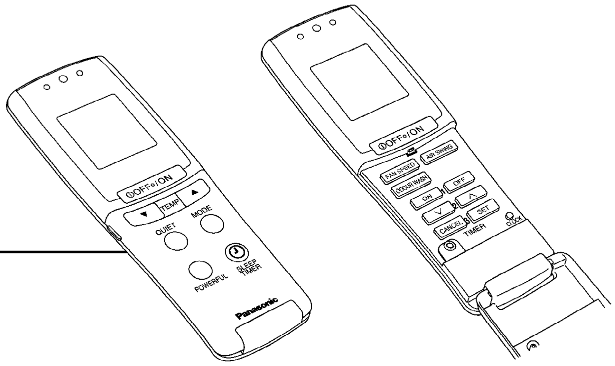
P.C. Boards (manufactured) using lead free solder will have a PbF stamp on the P.C. Board.

2.2. CAUTION

- **Pb free solder has a higher melting point than standard solder; Typically the melting point is 50 - 70 °F (30 - 40 °C) higher. Please use a high temperature solder iron and set it to 700 ± 20 °F (370 ± 10 °C).**
- **Pb free solder will tend to splash when heated too high (about 1100 °F/ 600 °C).**
  If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.

3. Functions

3.1. REMOTE CONTROL


OFF/ON
TEMP
MODE
QUIET
POWERFUL
SLEEP TIMER
Panasonic
FAN SPEED
AIR SWING
ODOUR WASH
ON
OFF
CANCEL
SET
TIMER
CLOCK

OFF / ON Ⓘ — **Operation OFF / ON**

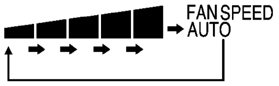
MODE — **Operation Mode Selection**

· AUTO	Automatic Operation Mode
· HEAT	Heating Operation Mode
· COOL	Cooling Operation Mode
· DRY	Soft Dry Operation Mode
· FAN	Fan Operation Mode

POWERFULL — **Powerfull Mode Operation**

QUIET — **Quiet Mode Operation**

FAN SPEED — **Indoor Fan Speed Selection**


FAN SPEED
AUTO

The indication will change accordingly
The increase in size of indication
indicates higher fan speed.

AIR SWING — **Airflow Direction Contrrol (Vertical)**

· AIR SWING AUTO	Automatic Airflow Direction Control
· AIR SWING–	Airflow Direction Manual Control

TEMP. — **Room Teemperature Setting**

· Temperature Setting (16˚C to 30˚C)

ON-TIMER OFF-TIMER — **Timer Operation Selection**

· 24-hour, OFF / ON Real Timer setting.

∨ ∧ — **Time / Timer setting**

· Hours and minutes setting.

SET CANCEL — **Timer Operation Set / Cancel**

· ON Timer and OFF Timer setting or cancellation.

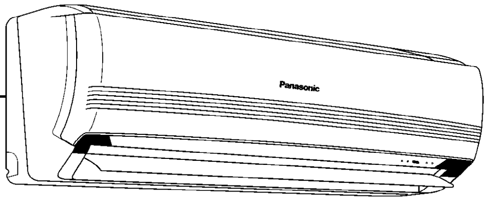
CLOCK — **Clock Setting**

· Current time setting.

SLEEP — **Sleep Timer (OFF)**

ODOUR WASH — **ODOUR WASH OPERATION**

3.2. INDOOR UNIT



FOR ALL OPERATIONS

Simultaneous Operation Control ※

Operation Indication Lamps

- POWER (GREEN) - Lights up in operation, blinks in Automatic Operation judging and Hot Start Control.
- TIMER (ORANGE) - Lights up in timer setting. Blinks in Self Diagnosis Control.
- FILTER (RED) - When the air conditioner has operated for a total of 360 hours or so, this lamp blinks during stopping.
- ODOUR WASH (GREEN) - Lights up ODOUR WASH Setting.

AUTO SW ※

- - 5s TEST RUN
- 5s - 8s FORCED OPERATION COOLING
- 8s - 11s FORCED OPERATION HEARTING
- 11s - 16s VARIOUS SETTING 1
  - REMOTE CONTROL A, B, C, D SETTING
- 16s - 21s ODOUR WASHING
- 21s - 26s VARIOUS SETTING 2
  - BEEP SOUND OFF

Operation Mode

- Automatic, Heating, Cooling, Dry and Fan Operation.

Automatic Restart Control ※

- Operation is restarted after power failure at previous setting mode.

Sleep timer / Sleep Operation Mode ※

QUIET Mode ※

Timer Operation ※

ODOUR WASH Operation ※

Powerful Mode ※

- For quick cooling or heating

Indoor Fan Speed Control ※

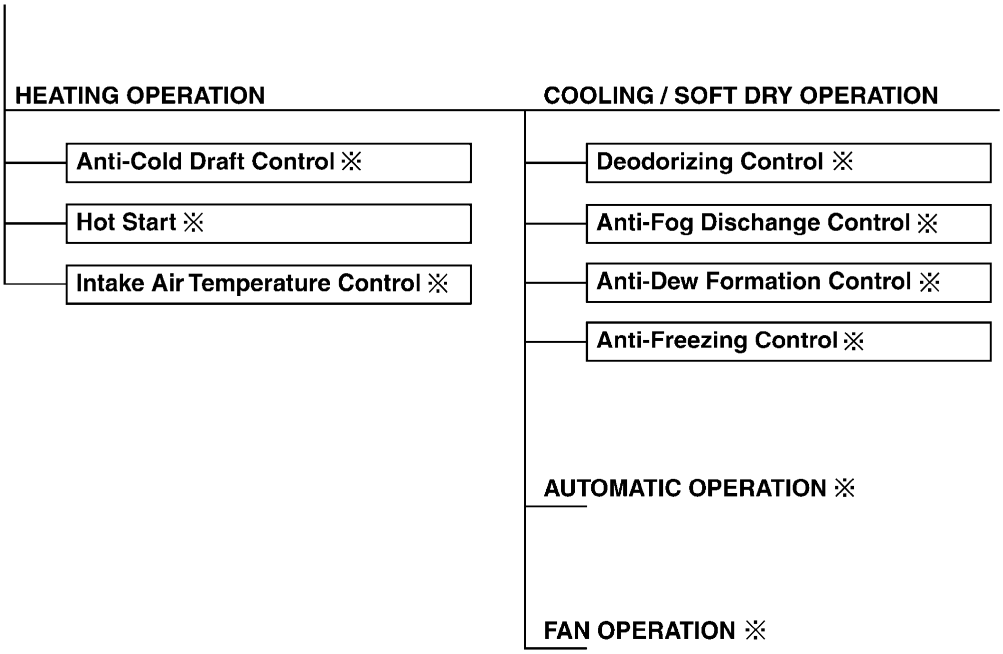
Airflow Direction Control ※

Room Temperature Control ※

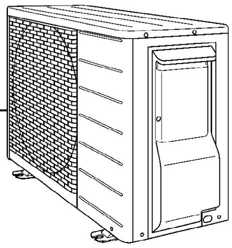
Operation Mode	Compresser Operation Frequency	
	One Indoor Unit operation	Two Indoor Unit operation
Cooling	16 - 67 Hz	16 - 77 Hz
Soft Dry	16 - 39 Hz	16 - 41 Hz
Heating	16 - 118 Hz	16 - 125 Hz

Temperature Shift ※

Self Diagnosis ※


HEATING OPERATION
Anti-Cold Draft Control ※
Hot Start ※
Intake Air Temperature Control ※
COOLING / SOFT DRY OPERATION
Deodorizing Control ※
Anti-Fog Dischange Control ※
Anti-Dew Formation Control ※
Anti-Freezing Control ※
AUTOMATIC OPERATION ※
FAN OPERATION ※

3.3. OUTDOOR UNIT



- Compressor Operating Frequency Control ※
- Deice Operation ※
- Outdoor Fan Motor Operation
- Time Delay Safety Control ※
- Total Running Current Control ※
- IPM Protection Control (DC Peak) ※
- Compressor Overheat Protection Control ※
- Over Load Protection Control ※
- Low Pressor Control (Gas Leak Protection) ※
- Outdoor Air Temperature Control ※
  - Detects outdoor ambient temperature and limits COOLING / HEATING capacity.
- Wrong Wiring And Piping Checking ※
- Pompdown Function
- 4-Way Valve Failure Protection

4. Product Specifications

4.1. PRODUCT SPECIFICATIONS

4.1.1. Indoor Unit

Model name			CS-ME7CKPG	CS-ME10CKPG	CS-ME12CKPG	CS-ME14CKPG	CS-ME18CKPG
Type			Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted	Wall Mounted
Power Source			Single phase, 230V, 50Hz (Power supply from outdoor unit)				
Air Volume (Hi)	Low Cooling(Heating)	m3/min.	6.1(7.2)	6.1(7.2)	6.7(8.4)	6.7(8.4)	7.6(9.2)
	Medium Cooling(Heating)	m3/min.	8.1(9.2)	8.1(9.2)	9.2(10.8)	9.2(10.8)	10.0(11.8)
	High Cooling(Heating)	m3/min.	10.1(11.2)	10.1(11.2)	11.6(11.6)	11.6(11.6)	12.1(14.4)
Noise level (Hi/Lo) Sound Pressure Level	Low Cooling(Heating)	dB	29(29)	29(29)	32(32)	32(33)	33(35)
	Medium Cooling(Heating)	dB	36(36)	36(36)	39(39)	39(39)	41(41)
	High Cooling(Heating)	dB	40(40)	40(40)	44(44)	44(44)	46(46)
Sound Power Level	Low Cooling(Heating)	dB	42(42)	42(42)	45(45)	45(46)	46(48)
	Medium Cooling(Heating)	dB	49(49)	49(49)	52(52)	52(52)	54(54)
	High Cooling(Heating)	dB	53(53)	53(53)	57(57)	57(57)	59(59)
Piping Connection Port	Gas side	inch	Half Union 3/8"				
(Flare piping)	Liquid side	inch	Half Union 1/4"				
Pipe Diameter	Gas side	inch	3/8"				
	Liquid side	inch	1/4"				
Connecting Cable (Indoor-Outdoor)			Polychloroprene Sheathed 4 x 1.5mm2 Flexible Code				
Dimensions	Height	mm	275				
	Width	mm	770				
	Depth	mm	230				
Air Circulation	Type		Cross-flow Fan				
	Motor Type		DC Brushless motor				
	Rated Output	w	30				
Fan Speed	Low Cooling(Heating)	rpm	860(890)	860(890)	920(1000)	920(1000)	1000(1070)
	Medium Cooling(Heating)	rpm	1060(1070)	1060(1070)	1170(1230)	1170(1230)	1250(1310)
	High Cooling(Heating)	rpm	1250(1250)	1250(1250)	1410(1450)	1410(1450)	1500(1540)
Heat Exchanger	Type		Plate fin configuration, forced draft type				
	Tube Material		Copper				
	Fin Material		Aluminium				
	Row/Stage		2 / 14				
	FPI		21				
Thermostat			Electronic Control				
Air Filter			Anti-Mold treated P.P Honeycomb				
Air Purifying Filter			Catechin coated Electrostatic Filter				
Deodorizing Filter			Charcoal coated filter				
Net Weight		kg	8.0				

*** Specifications are subject to change without notice for further improvement.**

Rating Conditions

	Cooling	Heating
Inside air temperature	27°C DB / 19°C WB	20°C DB
Outside air temperature	35°C DB / 24°C WB	7°C DB / 6°C WB

4.1.2. Outdoor Unit

Model name				CU-2E15CBPG	CU-2E18CBPG	CU-3E23CBPG	CU-4E27CBPG
Indoor-units Combination				2.2 kW + 2.2 kW	3.2 kW + 3.2 kW	2.8 kW + 3.2 kW + 4.0 kW	3.2 kW + 3.2 kW + 3.2 kW + 4.0 kW
Power Source				Single phase , 230 V, 50 Hz (Power supply from outdoor unit)			
Cooling Operation	Capacity		kW	4.5 (1.5 - 5.0)	5.2 (1.5 - 5.4)	6.8 (2.8 - 8.4)	8.0 (3.0 - 9.2)
	Electrical Data	Running Current	A	5.75	7.10	8.50	8.70
		Power Input	W	1 230 (250 - 1 350)	1 520 (250 - 1 580)	1 950 (490 - 2 800)	1 980 (530 - 2 870)
		EER	W/W	3.66	3.42	3.49	4.04
	Noise	Sound Pressure Level	dB	47	49	48	48
		Sound Power Level	dB	62	64	61	61
Heating Operation	Capacity		kW	5.4 (1.1 - 7.0)	5.6 (1.1 - 7.2)	8.6 (3.5 - 9.1)	9.4 (4.2 - 10.6)
	Electrical Data	Running Current	A	5.20	5.35	8.30	9.10
		Power Input	W	1 170 (210 - 1 670)	1 210 (210 - 1 700)	1 880 (560 - 2 710)	2 080 (700 - 3 060)
		COP	W/W	4.62	4.63	4.57	4.52
	Noise	Sound Pressure Level	dB	49	51	49	49
		Sound Power Level	dB	64	66	62	62
Maximum Current			A	12.0	12.0	18.5	19.0
Starting Current			A	5.75	7.10	8.50	9.10
Circuit Breaker Capacity			A	15	15	20	20
Dimensions	Height		mm	540	540	735	908
	Width		mm	780 (+70)	780 (+70)	826 (+110)	900
	Depth		mm	289	289	300	320
Net Weight			kg	38	38	57	73
Connecting Cable				3 + 1 (earth) ø1.5 mm2			
Pipe Length Range (1 room)			m	3 - 20	3 - 20	3 - 25	3 - 25
Maximum Pipe Length (Total room)			m	30	30	50	70
Refrigerant Pipe Diameter	Liquid Side		mm	6.35	6.35	6.35	6.35
	Gas Side		mm	9.52	9.52	9.52	9.52
Compressor	Type			Scroll Type		Hermetically Sealed Swing Type	
	Motor Type			DC Brushless(4-poles)		DC Brushless(4-poles)	
	Rated Output		W	1,200	1,500	1900	2200
Air Circulation	Type			Propeller Fan		Propeller Fan	
	Motor Type			DC Brushless(8-poles)		DC Brushless(8-poles)	
	Rated Output		W	40		53	51
Fan Speed	Low		rpm	690		700	680
	High		rpm	860		790	780
Heat Exchanger	Type			Plate fin configuration forced draft type			
	Tube Material			Copper			
	Fin Material			Aluminum			
	Row/Stage			2/20		2/32	2/40
	FPI			16.5		18	19
Air Volume	Low Cooling (Heating)		m3 / min.	---	---	45 (45)	42 (42)
	High Cooling (Heating)		m3 / min.	33.3(28.5)	34.5(31.0)	51 (47.6)	48.5 (45)
Refrigerant Control Device				Expansion Valve		Expansion Valve	
Refrigerant Oil				POE(RB-68A)		FOC50K(Ethers)	
Refrigerant (R410A)			g	1,450		2,600	3,100

*** Specifications are subject to change without notice for further improvement.**

4.2. APPROXIMATE COOLING AND HEATING CAPACITIES

CU-2E15CBPG

	Indoor Units Capacity	COOLING OPERATION					HEATING OPERATION				
		Cooling Capacity			Running Current	Power Input	Heating Capacity			Running Current	Power Input
		Room A	Room B	Total			Room A	Room B	Total		
		kW	kW	kW	A	W	kW	kW	kW	A	W
1 room	2.2	2.20	–	2.20 (1.1 - 2.9)	2.45	520 (220 - 750)	3.20	–	3.20 (0.7 - 4.8)	3.75	850 (170 - 1,410)
	2.8	2.80	–	2.80 (1.1 - 3.5)	3.50	750 (220 - 1,000)	4.00	–	4.00 (0.7 - 5.5)	5.10	1,150 (170 - 1,710)
2 rooms	2.2 + 2.2	2.25	2.25	4.50 (1.5 - 5.0)	5.75	1,230 (250 - 1,350)	2.70	2.70	5.40 (1.1 - 7.0)	5.20	1,170 (210 - 1,670)
	2.2 + 2.8	2.00	2.50	4.50 (1.5 - 5.2)	5.75	1,230 (250 - 1,520)	2.40	3.00	5.40 (1.1 - 7.0)	5.20	1,170 (210 - 1,670)

CU-2E18CBPG

	Indoor Units Capacity	COOLING OPERATION					HEATING OPERATION				
		Cooling Capacity			Running Current	Power Input	Heating Capacity			Running Current	Power Input
		Room A	Room B	Total			Room A	Room B	Total		
		kW	kW	kW	A	W	kW	kW	kW	A	W
1 room	2.2	2.20	—	2.20 (1.1 - 2.9)	2.45	520 (220 - 750)	3.20	—	3.20 (0.7 - 4.8)	3.75	850 (170 - 1,410)
	2.8	2.80	—	2.80 (1.1 - 3.5)	3.50	750 (220 - 1,000)	4.00	—	4.00 (0.7 - 5.5)	5.10	1,150 (170 - 1,700)
	3.2	3.20	—	3.20 (1.1 - 4.0)	4.30	920 (220 - 1,220)	4.50	—	4.50 (0.7 - 6.2)	5.55	1,250 (170 - 1,810)
2 rooms	2.2 + 2.2	2.25	2.25	4.50 (1.5 - 5.0)	5.75	1,230 (250 - 1,350)	2.70	2.70	5.40 (1.1 - 7.0)	5.20	1,170 (210 - 1,670)
	2.2 + 2.8	2.00	2.50	4.50 (1.5 - 5.2)	5.75	1,230 (250 - 1,520)	2.40	3.00	5.40 (1.1 - 7.0)	5.20	1,170 (210 - 1,670)
	2.2 + 3.2	1.95	2.85	4.80 (1.5 - 5.3)	6.10	1,310 (250 - 1,540)	2.30	3.30	5.60 (1.1 - 7.0)	5.45	1,230 (210 - 1,720)
	2.8 + 2.8	2.40	2.40	4.80 (1.5 - 5.2)	6.10	1,310 (250 - 1,520)	2.80	2.80	5.60 (1.1 - 7.2)	5.55	1,250 (210 - 1,740)
	2.8 + 3.2	2.30	2.70	5.00 (1.5 - 5.3)	6.95	1,490 (250 - 1,540)	2.60	3.00	5.60 (1.1 - 7.2)	5.45	1,230 (210 - 1,720)
	3.2 + 3.2	2.60	2.60	5.20 (1.5 - 5.4)	7.10	1,520 (250 - 1,580)	2.80	2.80	5.60 (1.1 - 7.2)	5.35	1,210 (210 - 1,700)

CU-3E23CBPG

	Indoor Unit Capacity	COOLING OPERATION						HEATING OPERATION					
		Cooling Capacity				Running Current	Power Input	Heating Capacity				Running Current	Power Input
		Room A	Room B	Room C	Total			Room A	Room B	Room C	Total		
		kW	kW	kW	kW	A	W	kW	kW	kW	kW	A	W
1 room	2.2	2.20	—	—	2.20 (1.9 - 2.7)	2.25	450 (380 - 620)	3.20	—	—	3.20 (1.7 - 4.1)	3.85	840 (370 - 1,310)
	2.8	2.80	—	—	2.80 (2.0 - 3.4)	2.95	620 (380 - 900)	4.00	—	—	4.00 (1.7 - 4.3)	5.40	1,210 (370 - 1,400)
	3.2	3.20	—	—	3.20 (2.0 - 3.9)	3.40	720 (380 - 1,090)	4.50	—	—	4.50 (1.7 - 5.7)	5.85	1,310 (370 - 1,910)
	4.0	4.00	—	—	4.00 (2.0 - 4.4)	4.60	1,030 (380 - 1,390)	5.60	—	—	5.60 (1.8 - 7.2)	8.35	1,900 (370 - 2,920)
	5.0	5.00	—	—	5.00 (2.1 - 5.2)	7.15	1,610 (400 - 1,800)	7.10	—	—	7.10 (2.1 - 7.3)	12.4	2,840 (430 - 2,890)
2 rooms	2.2 + 2.2	2.20	2.20	—	4.40 (2.1 - 5.0)	4.45	980 (400 - 1,260)	3.15	3.15	—	6.30 (1.8 - 8.6)	6.25	1,410 (400 - 2,570)
	2.2 + 2.8	2.20	2.80	—	5.00 (2.1 - 6.1)	5.50	1,230 (400 - 1,880)	3.10	4.00	—	7.10 (2.1 - 8.6)	7.55	1,700 (420 - 2,570)
	2.2 + 3.2	2.20	3.20	—	5.40 (2.2 - 7.0)	6.10	1,370 (400 - 2,790)	3.05	4.45	—	7.50 (2.2 - 8.7)	7.75	1,740 (420 - 2,970)
	2.2 + 4.0	2.20	4.00	—	6.20 (2.2 - 7.1)	8.00	1,820 (400 - 2,790)	2.90	5.30	—	8.20 (2.4 - 8.7)	8.85	2,010 (440 - 2,970)
	2.2 + 5.0	2.10	4.70	—	6.80 (2.5 - 7.1)	9.85	2,240 (460 - 2,800)	2.65	5.95	—	8.60 (3.2 - 9.0)	9.50	2,160 (530 - 2,960)
	2.8 + 2.8	2.80	2.80	—	5.60 (2.2 - 6.9)	6.85	1,550 (400 - 2,780)	3.85	3.85	—	7.70 (2.3 - 8.7)	8.45	1,930 (440 - 3,040)
	2.8 + 3.2	2.80	3.20	—	6.00 (2.2 - 7.0)	7.55	1,700 (400 - 2,790)	3.70	4.30	—	8.00 (2.4 - 8.8)	8.60	1,970 (440 - 3,020)
	2.8 + 4.0	2.80	4.00	—	6.80 (2.2 - 7.1)	10.5	2,390 (400 - 2,790)	3.55	5.05	—	8.60 (2.1 - 9.0)	9.55	2,175 (530 - 3,030)
	2.8 + 5.0	2.45	4.35	—	6.80 (2.5 - 7.2)	9.85	2,230 (460 - 2,800)	3.10	5.50	—	8.60 (3.2 - 9.0)	9.50	2,150 (530 - 3,010)
	3.2 + 3.2	3.20	3.20	—	6.40 (2.2 - 7.3)	8.15	1,860 (400 - 2,810)	4.20	4.20	—	8.40 (2.5 - 9.0)	9.05	2,050 (470 - 2,970)
	3.2 + 4.0	3.00	3.80	—	6.80 (2.5 - 7.3)	9.65	2,200 (460 - 2,810)	3.80	4.80	—	8.60 (3.2 - 9.0)	9.20	2,090 (530 - 2,970)
	3.2 + 5.0	2.65	4.15	—	6.80 (2.6 - 7.4)	9.30	2,120 (460 - 2,820)	3.35	5.25	—	8.60 (3.2 - 9.0)	9.15	2,080 (530 - 2,950)
	4.0 + 4.0	3.40	3.40	—	6.80 (2.5 - 7.3)	9.65	2,190 (460 - 2,810)	4.30	4.30	—	8.60 (3.2 - 9.0)	9.15	2,080 (530 - 2,970)
	4.0 + 5.0	3.00	3.80	—	6.80 (2.7 - 7.4)	9.30	2,110 (480 - 2,820)	3.80	4.80	—	8.60 (3.2 - 9.1)	9.15	2,070 (530 - 2,950)
	5.0 + 5.0	3.40	3.40	—	6.80 (2.8 - 7.4)	9.15	2,070 (480 - 2,820)	4.30	4.30	—	8.60 (3.5 - 9.1)	9.15	2,070 (590 - 2,940)
3 rooms	2.2 + 2.2 + 2.2	2.20	2.20	2.20	6.60 (2.2 - 7.7)	8.10	1,850 (410 - 2,450)	2.86	2.86	2.86	8.58 (3.1 - 8.9)	8.50	1,940 (500 - 2,800)
	2.2 + 2.2 + 2.8	2.10	2.10	2.60	6.80 (2.5 - 8.1)	8.70	1,980 (460 - 2,820)	2.65	2.65	3.30	8.60 (3.2 - 8.9)	8.70	1,980 (510 - 2,800)
	2.2 + 2.2 + 3.2	1.95	1.95	2.90	6.80 (2.5 - 8.1)	8.80	1,990 (460 - 2,790)	2.50	2.50	3.60	8.60 (3.2 - 9.0)	8.60	1,960 (510 - 2,780)
	2.2 + 2.2 + 4.0	1.80	1.80	3.20	6.80 (2.6 - 8.2)	8.60	1,970 (460 - 2,790)	2.25	2.25	4.10	8.60 (3.2 - 8.8)	8.50	1,940 (510 - 2,760)
	2.2 + 2.2 + 5.0	1.60	1.60	3.60	6.80 (2.8 - 8.3)	8.60	1,960 (490 - 2,790)	2.00	2.00	4.60	8.60 (3.2 - 8.8)	8.45	1,920 (510 - 2,760)
	2.2 + 2.8 + 2.8	1.90	2.45	2.45	6.80 (2.5 - 8.1)	8.50	1,950 (460 - 2,780)	2.40	3.10	3.10	8.60 (3.2 - 9.0)	8.45	1,930 (510 - 2,730)
	2.2 + 2.8 + 3.2	1.80	2.35	2.65	6.80 (2.6 - 8.1)	8.70	1,980 (460 - 2,790)	2.30	2.95	3.35	8.60 (3.2 - 8.8)	8.45	1,930 (510 - 2,760)
	2.2 + 2.8 + 4.0	1.65	2.15	3.00	6.80 (2.7 - 8.2)	8.60	1,960 (490 - 2,790)	2.10	2.70	3.80	8.60 (3.2 - 9.0)	8.35	1,910 (510 - 2,760)
	2.2 + 2.8 + 5.0	1.50	1.90	3.40	6.80 (2.8 - 8.3)	8.50	1,950 (490 - 2,790)	1.90	2.40	4.30	8.60 (3.5 - 9.0)	8.45	1,920 (560 - 2,730)
	2.2 + 3.2 + 3.2	1.70	2.55	2.55	6.80 (2.7 - 8.3)	8.60	1,970 (460 - 2,800)	2.20	3.20	3.20	8.60 (3.2 - 9.1)	8.35	1,910 (500 - 2,710)
	2.2 + 3.2 + 4.0	1.60	2.30	2.90	6.80 (2.8 - 8.3)	8.50	1,950 (490 - 2,800)	2.00	2.95	3.65	8.60 (3.2 - 9.0)	8.25	1,890 (500 - 2,710)
	2.8 + 2.8 + 2.8	2.26	2.26	2.26	6.78 (2.6 - 8.1)	8.50	1,940 (460 - 2,820)	2.86	2.86	2.86	8.58 (3.2 - 9.0)	8.35	1,910 (510 - 2,760)
	2.8 + 2.8 + 3.2	2.15	2.15	2.50	6.80 (2.7 - 8.2)	8.60	1,960 (490 - 2,790)	2.75	2.75	3.10	8.60 (3.2 - 9.0)	8.45	1,920 (510 - 2,760)
	2.8 + 2.8 + 4.0	2.00	2.00	2.80	6.80 (2.8 - 8.2)	8.50	1,950 (490 - 2,790)	2.50	2.50	3.60	8.60 (3.3 - 9.0)	8.35	1,900 (530 - 2,760)
	2.8 + 3.2 + 3.2	2.10	2.35	2.35	6.80 (2.7 - 8.3)	8.60	1,960 (490 - 2,800)	2.60	3.00	3.00	8.60 (3.2 - 9.0)	8.35	1,900 (500 - 2,710)
	2.8 + 3.2 + 4.0	1.90	2.20	2.70	6.80 (2.8 - 8.4)	8.50	1,950 (490 - 2,800)	2.40	2.75	3.45	8.60 (3.5 - 9.1)	8.30	1,880 (560 - 2,710)
	3.2 + 3.2 + 3.2	2.26	2.26	2.26	6.78 (2.8 - 8.5)	8.60	1,960 (490 - 2,800)	2.86	2.86	2.86	8.58 (3.3 - 9.1)	8.10	1,850 (520 - 2,670)

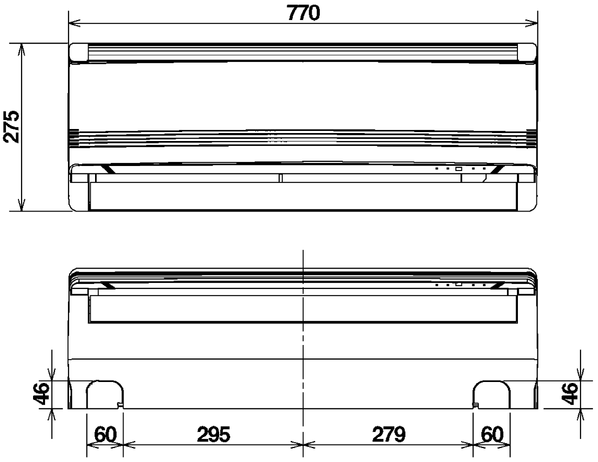
CU-4E27CBPG

	Indoor Units Capacity	COOLING OPERATION							HEATING OPERATION						
		Cooling Capacity					Running Current	Power Input	Heating Capacity					Running Current	Power Input
		Room **A**	Room **B**	Room **C**	Room **D**	**Total**			Room **A**	Room **B**	Room **C**	Room **D**	**Total**		
		kW	kW	kW	kW	kW	A	W	kW	kW	kW	kW	kW	A	W
1 room	2.2	2.20	—	—	—	2.20 (1.9 - 2.7)	2.25	450 (380 - 620)	3.20	—	—	—	3.20 (1.7 - 4.7)	3.85	840 (370 - 1,830)
	2.8	2.80	—	—	—	2.80 (2.0 - 3.4)	2.95	620 (380 - 900)	4.00	—	—	—	4.00 (1.7 - 4.8)	5.40	1,210 (370 - 1,900)
	3.2	3.20	—	—	—	3.20 (2.0 - 3.9)	3.40	720 (380 - 1,090)	4.50	—	—	—	4.50 (1.7 - 5.8)	5.85	1,310 (370 - 2,290)
	4.0	4.00	—	—	—	4.00 (2.0 - 4.4)	4.60	1,030 (380 - 1,390)	5.60	—	—	—	5.60 (1.8 - 7.2)	8.35	1,900 (370 - 3,560)
	5.0	5.00	—	—	—	5.00 (2.1 - 5.2)	7.15	1,610 (400 - 1,800)	7.10	—	—	—	7.10 (2.1 - 7.3)	12.4	2,840 (430 - 3,560)
2 rooms	2.2 + 2.2	2.20	2.20	—	—	4.40 (2.1 - 5.0)	4.45	980 (400 - 1,260)	3.20	3.20	—	—	6.40 (1.8 - 9.4)	6.50	1,480 (400 - 3,550)
	2.2 + 2.8	2.20	2.80	—	—	5.00 (2.1 - 6.1)	5.50	1,230 (400 - 1,880)	3.10	4.00	—	—	7.10 (2.1 - 9.4)	7.55	1,700 (420 - 3,510)
	2.2 + 3.2	2.20	3.20	—	—	5.40 (2.2 - 7.0)	6.10	1,370 (400 - 2,790)	3.05	4.45	—	—	7.50 (2.2 - 9.8)	7.65	1,740 (420 - 3,490)
	2.2 + 4.0	2.20	4.00	—	—	6.20 (2.2 - 7.1)	8.00	1,820 (400 - 2,790)	3.00	5.30	—	—	8.30 (2.4 - 9.8)	9.05	2,060 (440 - 3,440)
	2.2 + 5.0	2.10	4.90	—	—	7.00 (2.5 - 7.2)	11.0	2,500 (460 - 2,800)	2.70	6.10	—	—	8.80 (3.2 - 9.9)	9.90	2,260 (530 - 3,400)
	2.8 + 2.8	2.80	2.80	—	—	5.60 (2.2 - 6.9)	6.85	1,550 (400 - 2,780)	3.85	3.85	—	—	7.70 (2.3 - 9.4)	8.85	2,020 (440 - 3,480)
	2.8 + 3.2	2.80	3.20	—	—	6.00 (2.2 - 7.0)	7.55	1,700 (400 - 2,790)	3.80	4.30	—	—	8.10 (2.4 - 9.8)	8.70	1,980 (440 - 3,460)
	2.8 + 4.0	2.80	4.00	—	—	6.80 (2.2 - 7.1)	10.0	2,280 (400 - 2,790)	3.55	5.05	—	—	8.60 (2.1 - 9.8)	9.65	2,175 (530 - 3,390)
	2.8 + 5.0	2.55	4.55	—	—	7.10 (2.5 - 7.2)	11.5	2,610 (460 - 2,800)	3.25	5.75	—	—	9.00 (3.2 - 9.9)	10.5	2,390 (530 - 3,370)
	3.2 + 3.2	3.20	3.20	—	—	6.40 (2.2 - 7.3)	8.15	1,860 (400 - 2,810)	4.25	4.25	—	—	8.50 (2.5 - 10.1)	9.30	2,110 (470 - 3,390)
	3.2 + 4.0	3.10	3.90	—	—	7.00 (2.5 - 7.3)	10.6	2,410 (460 - 2,810)	3.90	4.90	—	—	8.80 (3.2 - 10.1)	9.85	2,230 (530 - 3,340)
	3.2 + 5.0	2.90	4.50	—	—	7.40 (2.6 - 7.4)	12.3	2,820 (460 - 2,880)	3.60	5.60	—	—	9.20 (3.2 - 10.1)	10.5	2,390 (530 - 3,300)
	4.0 + 4.0	3.60	3.60	—	—	7.20 (2.5 - 7.3)	11.5	2,620 (460 - 2,810)	4.55	4.55	—	—	9.10 (3.2 - 10.1)	10.3	2,360 (530 - 3,320)
	4.0 + 5.0	3.25	4.05	—	—	7.30 (2.7 - 7.4)	11.7	2,670 (480 - 2,820)	4.20	5.20	—	—	9.40 (3.2 - 10.2)	10.9	2,480 (530 - 3,300)
	5.0 + 5.0	3.75	3.75	—	—	7.50 (2.8 - 7.6)	12.5	2,860 (480 - 2,870)	4.70	4.70	—	—	9.40 (3.5 - 10.2)	10.9	2,470 (590 - 3,290)
3 rooms	2.2 + 2.2 + 2.2	2.20	2.20	2.20	—	6.60 (2.2 - 7.8)	7.40	1,660 (410 - 2,490)	2.87	2.87	2.87	—	8.61 (3.1 - 10.4)	8.80	1,990 (500 - 3,250)
	2.2 + 2.2 + 2.8	2.15	2.15	2.70	—	7.00 (2.5 - 8.1)	8.25	1,890 (460 - 2,850)	2.70	2.70	3.40	—	8.80 (3.2 - 10.4)	8.85	2,010 (510 - 3,220)
	2.2 + 2.2 + 3.2	2.10	2.10	3.10	—	7.30 (2.5 - 8.2)	8.70	1,980 (460 - 2,790)	2.60	2.60	3.70	—	8.90 (3.2 - 10.4)	8.95	2,030 (510 - 3,220)
	2.2 + 2.2 + 4.0	2.05	2.05	3.70	—	7.80 (2.6 - 8.2)	10.3	2,330 (460 - 2,830)	2.40	2.40	4.40	—	9.20 (3.2 - 10.4)	9.50	2,150 (510 - 3,180)
	2.2 + 2.2 + 5.0	1.85	1.85	4.30	—	8.00 (2.8 - 8.3)	10.8	2,460 (490 - 2,820)	2.20	2.20	5.00	—	9.40 (3.2 - 10.4)	9.30	2,120 (510 - 3,180)
	2.2 + 2.8 + 2.8	2.10	2.65	2.65	—	7.40 (2.5 - 8.1)	9.40	2,140 (460 - 2,790)	2.50	3.25	3.25	—	9.00 (3.2 - 10.4)	9.20	2,090 (510 - 3,190)
	2.2 + 2.8 + 3.2	2.00	2.60	3.00	—	7.60 (2.6 - 8.2)	9.85	2,240 (460 - 2,840)	2.45	3.15	3.60	—	9.20 (3.2 - 10.4)	9.30	2,110 (510 - 3,180)
	2.2 + 2.8 + 4.0	1.95	2.50	3.55	—	8.00 (2.7 - 8.2)	11.0	2,510 (490 - 2,800)	2.30	2.90	4.20	—	9.40 (3.2 - 10.4)	9.50	2,160 (510 - 3,140)
	2.2 + 2.8 + 5.0	1.75	2.25	4.00	—	8.00 (2.8 - 8.3)	10.8	2,460 (490 - 2,800)	2.05	2.65	4.70	—	9.40 (3.5 - 10.4)	9.15	2,080 (560 - 3,150)
	2.2 + 3.2 + 3.2	2.00	2.95	2.95	—	7.90 (2.7 - 8.3)	10.1	2,290 (460 - 2,810)	2.40	3.45	3.45	—	9.30 (3.2 - 10.5)	9.40	2,130 (500 - 3,180)
	2.2 + 3.2 + 4.0	1.90	2.70	3.40	—	8.00 (2.8 - 8.4)	10.4	2,380 (490 - 2,840)	2.20	3.20	4.00	—	9.40 (3.2 - 10.5)	9.50	2,150 (500 - 3,140)
	2.2 + 3.2 + 5.0	1.70	2.45	3.85	—	8.00 (2.8 - 8.3)	10.9	2,470 (490 - 2,840)	2.00	2.90	4.50	—	9.40 (3.7 - 10.5)	9.55	2,170 (620 - 3,140)
	2.2 + 4.0 + 4.0	1.70	3.15	3.15	—	8.00 (2.8 - 8.4)	10.4	2,380 (490 - 2,810)	2.00	3.70	3.70	—	9.40 (3.6 - 10.5)	9.30	2,110 (620 - 3,110)
	2.2 + 4.0 + 5.0	1.60	2.85	3.55	—	8.00 (2.8 - 8.3)	10.9	2,470 (490 - 2,810)	1.85	3.35	4.20	—	9.40 (3.9 - 10.5)	9.30	2,120 (660 - 3,110)
	2.2 + 5.0 + 5.0	1.40	3.30	3.30	—	8.00 (2.9 - 8.4)	10.7	2,430 (490 - 2,830)	1.70	3.85	3.85	—	9.40 (4.1 - 10.5)	9.55	2,170 (700 - 3,120)
	2.8 + 2.8 + 2.8	2.60	2.60	2.60	—	7.80 (2.6 - 8.1)	10.8	2,450 (460 - 2,820)	3.08	3.08	3.08	—	9.24 (3.2 - 10.4)	9.55	2,170 (510 - 3,160)
	2.8 + 2.8 + 3.2	2.55	2.55	2.90	—	8.00 (2.7 - 8.2)	11.0	2,510 (490 - 2,810)	3.00	3.00	3.40	—	9.40 (3.2 - 10.4)	9.65	2,190 (510 - 3,150)
	2.8 + 2.8 + 4.0	2.35	2.35	3.30	—	8.00 (2.8 - 8.2)	11.0	2,510 (490 - 2,790)	2.75	2.75	3.90	—	9.40 (3.3 - 10.4)	9.40	2,140 (530 - 3,130)
	2.8 + 2.8 + 5.0	2.10	2.10	3.80	—	8.00 (2.8 - 8.3)	10.8	2,460 (490 - 2,790)	2.50	2.50	4.40	—	9.40 (3.8 - 10.4)	9.20	2,100 (640 - 3,120)
	2.8 + 3.2 + 3.2	2.40	2.80	2.80	—	8.00 (2.7 - 8.4)	10.4	2,380 (490 - 2,850)	2.90	3.25	3.25	—	9.40 (3.2 - 10.5)	9.55	2,170 (500 - 3,150)
	2.8 + 3.2 + 4.0	2.25	2.55	3.20	—	8.00 (2.8 - 8.4)	10.4	2,380 (490 - 2,820)	2.65	3.00	3.75	—	9.40 (3.5 - 10.5)	9.40	2,130 (560 - 3,120)
	2.8 + 3.2 + 5.0	2.05	2.30	3.65	—	8.00 (2.8 - 8.4)	10.3	2,340 (490 - 2,830)	2.40	2.70	4.30	—	9.40 (3.9 - 10.5)	9.50	2,150 (660 - 3,120)
	2.8 + 4.0 + 4.0	2.10	2.95	2.95	—	8.00 (2.8 - 8.4)	10.4	2,380 (490 - 2,800)	2.40	3.50	3.50	—	9.40 (3.8 - 10.5)	9.05	2,060 (640 - 3,080)
	2.8 + 4.0 + 5.0	1.90	2.70	3.40	—	8.00 (2.8 - 8.4)	10.3	2,340 (490 - 2,800)	2.20	3.20	4.00	—	9.40 (4.0 - 10.5)	9.20	2,100 (680 - 3,080)
	2.8 + 5.0 + 5.0	1.70	3.15	3.15	—	8.00 (2.9 - 8.5)	10.3	2,340 (520 - 2,800)	2.10	3.65	3.65	—	9.40 (4.2 - 10.5)	9.40	2,140 (700 - 3,080)
	3.2 + 3.2 + 3.2	2.66	2.66	2.66	—	7.98 (2.8 - 8.5)	10.1	2,300 (490 - 2,830)	3.13	3.13	3.13	—	9.39 (3.3 - 10.5)	9.50	2,160 (520 - 3,180)
	3.2 + 3.2 + 4.0	2.45	2.45	3.10	—	8.00 (2.8 - 8.4)	10.5	2,390 (490 - 2,800)	2.90	2.90	3.60	—	9.40 (3.7 - 10.5)	9.40	2,140 (620 - 3,150)
	3.2 + 3.2 + 5.0	2.25	2.25	3.50	—	8.00 (2.8 - 8.4)	10.5	2,390 (490 - 2,830)	2.65	2.65	4.10	—	9.40 (4.0 - 10.5)	9.40	2,130 (680 - 3,120)
	3.2 + 4.0 + 4.0	2.30	2.85	2.85	—	8.00 (2.8 - 8.4)	10.5	2,390 (490 - 2,820)	2.70	3.35	3.35	—	9.40 (3.9 - 10.5)	9.30	2,120 (660 - 3,120)
	3.2 + 4.0 + 5.0	2.10	2.60	3.30	—	8.00 (2.9 - 8.4)	10.3	2,350 (490 - 2,820)	2.45	3.10	3.85	—	9.40 (4.1 - 10.5)	9.20	2,100 (700 - 3,100)
	3.2 + 5.0 + 5.0	1.90	3.05	3.05	—	8.00 (2.9 - 8.5)	10.3	2,350 (520 - 2,810)	2.30	3.55	3.55	—	9.40 (4.2 - 10.5)	9.05	2,060 (700 - 3,080)
	4.0 + 4.0 + 4.0	2.66	2.66	2.66	—	7.98 (2.9 - 8.4)	10.5	2,390 (490 - 2,840)	3.13	3.13	3.13	—	9.39 (4.0 - 10.5)	9.20	2,100 (680 - 3,080)
	4.0 + 4.0 + 5.0	2.45	2.45	3.10	—	8.00 (2.9 - 8.4)	10.5	2,390 (520 - 2,810)	2.90	2.90	3.60	—	9.40 (4.2 - 10.5)	9.15	2,080 (700 - 3,080)
4 rooms	2.2 + 2.2 + 2.2 + 2.2	2.00	2.00	2.00	2.00	8.00 (2.7 - 8.8)	9.50	2,150 (490 - 2,840)	2.35	2.35	2.35	2.35	9.40 (3.2 - 10.5)	9.15	2,080 (550 - 3,140)
	2.2 + 2.2 + 2.2 + 2.8	1.85	1.85	1.85	2.45	8.00 (2.8 - 8.8)	9.40	2,140 (490 - 2,880)	2.20	2.20	2.20	2.80	9.40 (3.2 - 10.5)	9.05	2,060 (550 - 3,120)
	2.2 + 2.2 + 2.2 + 3.2	1.80	1.80	1.80	2.60	8.00 (2.8 - 8.9)	9.40	2,130 (490 - 2,880)	2.10	2.10	2.10	3.10	9.40 (3.4 - 10.5)	9.30	2,120 (590 - 3,180)
	2.2 + 2.2 + 2.2 + 4.0	1.65	1.65	1.65	3.05	8.00 (2.8 - 8.9)	9.30	2,110 (490 - 2,870)	1.95	1.95	1.95	3.55	9.40 (3.8 - 10.5)	9.20	2,090 (640 - 3,140)
	2.2 + 2.2 + 2.2 + 5.0	1.50	1.50	1.50	3.50	8.00 (2.8 - 8.9)	9.30	2,110 (490 - 2,840)	1.80	1.80	1.80	4.00	9.40 (4.0 - 10.5)	9.30	2,120 (680 - 3,110)
	2.2 + 2.2 + 2.8 + 2.8	1.75	1.75	2.25	2.25	8.00 (2.8 - 8.8)	9.40	2,130 (490 - 2,870)	2.05	2.05	2.65	2.65	9.40 (3.5 - 10.5)	9.05	2,050 (610 - 3,110)
	2.2 + 2.2 + 2.8 + 3.2	1.70	1.70	2.15	2.45	8.00 (2.8 - 8.9)	9.30	2,120 (490 - 2,870)	2.00	2.00	2.50	2.90	9.40 (3.7 - 10.5)	9.20	2,100 (620 - 3,160)
	2.2 + 2.2 + 2.8 + 4.0	1.55	1.55	2.00	2.90	8.00 (2.8 - 8.9)	9.20	2,090 (490 - 2,840)	1.85	1.85	2.35	3.35	9.40 (3.9 - 10.5)	9.10	2,070 (660 - 3,110)
	2.2 + 2.2 + 2.8 + 5.0	1.45	1.45	1.85	3.25	8.00 (2.9 - 8.9)	9.30	2,110 (520 - 2,880)	1.70	1.70	2.15	3.85	9.40 (4.1 - 10.5)	9.20	2,090 (700 - 3,100)
	2.2 + 2.2 + 3.2 + 3.2	1.65	1.65	2.35	2.35	8.00 (2.8 - 8.9)	9.20	2,090 (500 - 2,870)	1.90	1.90	2.80	2.80	9.40 (3.8 - 10.5)	9.30	2,110 (640 - 3,190)
	2.2 + 2.2 + 3.2 + 4.0	1.50	1.50	2.20	2.80	8.00 (2.8 - 8.9)	9.15	2,080 (500 - 2,840)	1.80	1.80	2.55	3.25	9.40 (4.0 - 10.5)	9.15	2,080 (680 - 3,150)
	2.2 + 2.2 + 3.2 + 5.0	1.40	1.40	2.05	3.15	8.00 (2.9 - 9.0)	8.95	2,040 (520 - 2,860)	1.65	1.65	2.40	3.70	9.40 (4.1 - 10.5)	9.30	2,110 (700 - 3,080)
	2.2 + 2.2 + 4.0 + 4.0	1.40	1.40	2.60	2.60	8.00 (2.9 - 9.0)	9.05	2,060 (520 - 2,850)	1.65	1.65	3.05	3.05	9.40 (4.1 - 10.5)	9.05	2,050 (700 - 3,110)
	2.2 + 2.2 + 4.0 + 5.0	1.30	1.30	2.40	3.00	8.00 (2.9 - 9.0)	8.85	2,020 (520 - 2,880)	1.55	1.55	2.80	3.50	9.40 (4.2 - 10.5)	9.15	2,080 (700 - 3,060)
	2.2 + 2.8 + 2.8 + 2.8	1.70	2.10	2.10	2.10	8.00 (2.8 - 8.8)	9.30	2,120 (490 - 2,850)	1.90	2.50	2.50	2.50	9.40 (3.8 - 10.5)	8.95	2,040 (640 - 3,080)
	2.2 + 2.8 + 2.8 + 3.2	1.60	2.05	2.05	2.30	8.00 (2.8 - 8.9)	9.20	2,100 (490 - 2,850)	1.85	2.40	2.40	2.75	9.40 (3.9 - 10.5)	9.15	2,080 (660 - 3,130)
	2.2 + 2.8 + 2.8 + 4.0	1.50	1.90	1.90	2.70	8.00 (2.8 - 8.9)	9.40	2,130 (490 - 2,860)	1.75	2.25	2.25	3.15	9.40 (4.0 - 10.5)	9.05	2,050 (680 - 3,080)
	2.2 + 2.8 + 2.8 + 5.0	1.40	1.75	1.75	3.10	8.00 (2.9 - 8.9)	9.30	2,110 (520 - 2,860)	1.65	2.05	2.05	3.65	9.40 (4.2 - 10.5)	9.15	2,080 (700 - 3,080)
	2.2 + 2.8 + 3.2 + 3.2	1.55	1.95	2.25	2.25	8.00 (2.8 - 8.9)	9.40	2,130 (500 - 2,850)	1.80	2.30	2.65	2.65	9.40 (4.0 - 10.5)	9.20	2,090 (680 - 3,180)
	2.2 + 2.8 + 3.2 + 4.0	1.45	1.85	2.10	2.60	8.00 (2.9 - 9.0)	9.15	2,070 (520 - 2,860)	1.70	2.15	2.45	3.10	9.40 (4.1 - 10.5)	9.05	2,060 (700 - 3,120)
	2.2 + 2.8 + 3.2 + 5.0	1.30	1.70	1.95	3.05	8.00 (2.9 - 9.0)	8.95	2,030 (520 - 2,840)	1.55	2.00	2.30	3.55	9.40 (4.2 - 10.5)	9.20	2,090 (700 - 3,080)
	2.2 + 2.8 + 4.0 + 4.0	1.35	1.75	2.45	2.45	8.00 (2.9 - 9.0)	8.95	2,040 (520 - 2,870)	1.60	2.00	2.90	2.90	9.40 (4.2 - 10.5)	8.95	2,030 (700 - 3,080)
	2.2 + 3.2 + 3.2 + 3.2	1.55	2.15	2.15	2.15	8.00 (2.8 - 9.1)	8.95	2,040 (500 - 2,870)	1.75	2.55	2.55	2.55	9.40 (4.0 - 10.6)	9.30	2,110 (680 - 3,120)
	2.2 + 3.2 + 3.2 + 4.0	1.40	2.05	2.05	2.50	8.00 (2.9 - 9.1)	8.85	2,020 (520 - 2,840)	1.60	2.40	2.40	3.00	9.40 (4.1 - 10.6)	9.15	2,080 (700 - 3,080)
	2.2 + 3.2 + 3.2 + 5.0	1.30	1.90	1.90	2.90	8.00 (3.0 - 9.2)	8.80	2,000 (530 - 2,870)	1.55	2.20	2.20	3.45	9.40 (4.2 - 10.6)	9.30	2,110 (700 - 3,060)
	2.2 + 3.2 + 4.0 + 4.0	1.30	1.90	2.40	2.40	8.00 (2.9 - 9.1)	9.20	2,090 (520 - 2,860)	1.55	2.25	2.80	2.80	9.40 (4.2 - 10.6)	9.05	2,060 (700 - 3,060)
	2.8 + 2.8 + 2.8 + 2.8	2.00	2.00	2.00	2.00	8.00 (2.8 - 8.8)	9.30	2,110 (490 - 2,840)	2.35	2.35	2.35	2.35	9.40 (3.9 - 10.5)	8.95	2,030 (660 - 3,080)
	2.8 + 2.8 + 2.8 + 3.2	1.95	1.95	1.95	2.15	8.00 (2.8 - 8.9)	9.20	2,090 (490 - 2,870)	2.25	2.25	2.25	2.65	9.40 (4.0 - 10.5)	9.05	2,060 (680 - 3,100)
	2.8 + 2.8 + 2.8 + 4.0	1.80	1.80	1.80	2.60	8.00 (2.9 - 8.9)	9.30	2,120 (520 - 2,850)	2.10	2.10	2.10	3.10	9.40 (4.1 - 10.5)	8.95	2,040 (700 - 3,070)
	2.8 + 2.8 + 2.8 + 5.0	1.65	1.65	1.65	3.05	8.00 (2.9 - 8.9)	9.30	2,110 (520 - 2,850)	1.95	1.95	1.95	3.55	9.40 (4.2 - 10.5)	9.15	2,070 (700 - 3,070)
	2.8 + 2.8 + 3.2 + 3.2	1.85	1.85	2.15	2.15	8.00 (2.9 - 9.0)	9.15	2,080 (500 - 2,870)	2.20	2.20	2.50	2.50	9.40 (4.0 - 10.5)	9.15	2,070 (680 - 3,140)
	2.8 + 2.8 + 3.2 + 4.0	1.75	1.75	2.00	2.50	8.00 (2.9 - 9.0)	9.05	2,050 (520 - 2,880)	2.05	2.05	2.35	2.95	9.40 (4.2 - 10.5)	8.95	2,040 (700 - 3,080)
	2.8 + 2.8 + 4.0 + 4.0	1.65	1.65	2.35	2.35	8.00 (3.0 - 9.0)	8.95	2,040 (520 - 2,860)	1.95	1.95	2.75	2.75	9.40 (4.2 - 10.5)	8.85	2,020 (700 - 3,070)
	2.8 + 3.2 + 3.2 + 3.2	1.85	2.05	2.05	2.05	8.00 (2.9 - 9.1)	8.95	2,030 (520 - 2,860)	2.05	2.45	2.45	2.45	9.40 (4.1 - 10.6)	9.20	2,090 (700 - 3,100)
	2.8 + 3.2 + 3.2 + 4.0	1.70	1.95	1.95	2.40	8.00 (2.9 - 9.1)	8.85	2,010 (520 - 2,880)	1.95	2.30	2.30	2.85	9.40 (4.2 - 10.6)	9.15	2,070 (700 - 3,080)
	3.2 + 3.2 + 3.2 + 3.2	2.00	2.00	2.00	2.00	8.00 (2.9 - 9.2)	8.80	2,000 (530 - 2,850)	2.35	2.35	2.35	2.35	9.40 (4.2 - 10.6)	9.30	2,110 (700 - 3,080)
	3.2 + 3.2 + 3.2 + 4.0	1.90	1.90	1.90	2.30	8.00 (3.0 - 9.2)	8.70	1,980 (530 - 2,870)	2.20	2.20	2.20	2.80	9.40 (4.2 - 10.6)	9.10	2,080 (700 - 3,060)

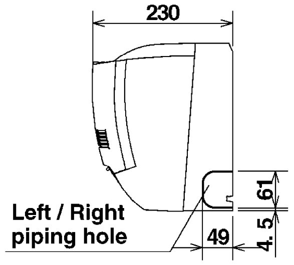
5. Dimensions

5.1. INDOOR UNIT (CS-ME7CKPG/ME10CKPG/ME12CKPG/ ME14CKPG/ME18CKPG)

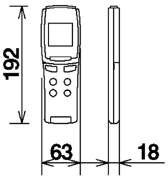
< Front View >


770
275
46
46
60
295
279
60

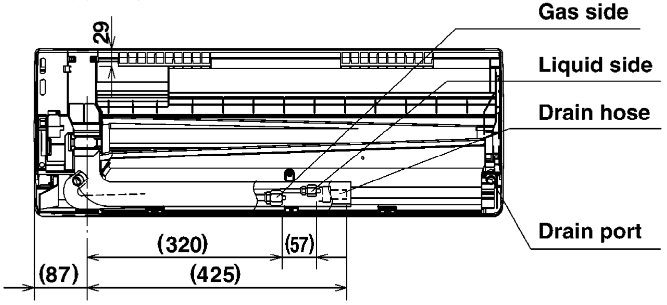
< Side View >


230
Left / Right
piping hole
61
49
4. 5

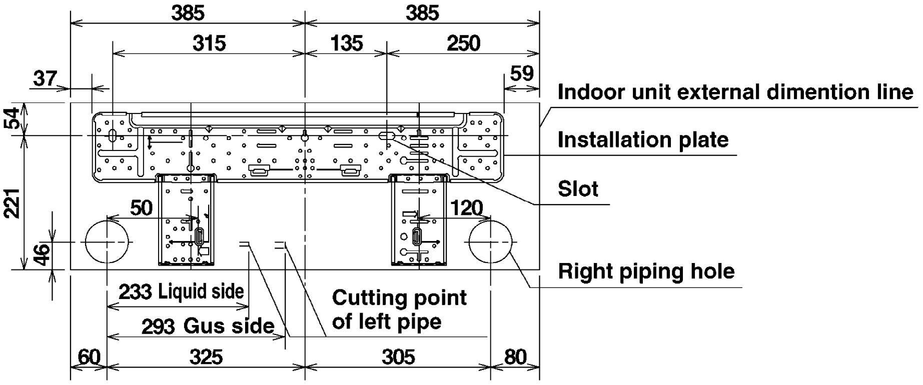
Remote control transmitter



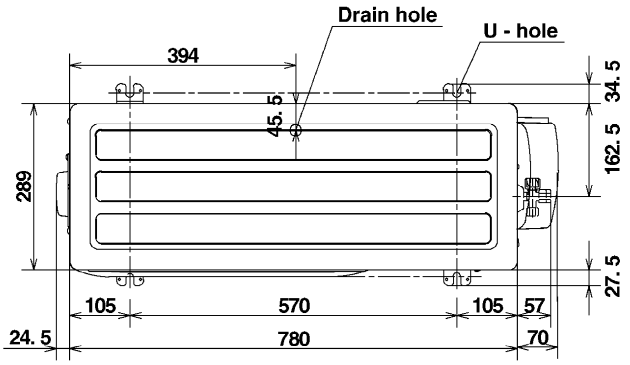
< Back View >

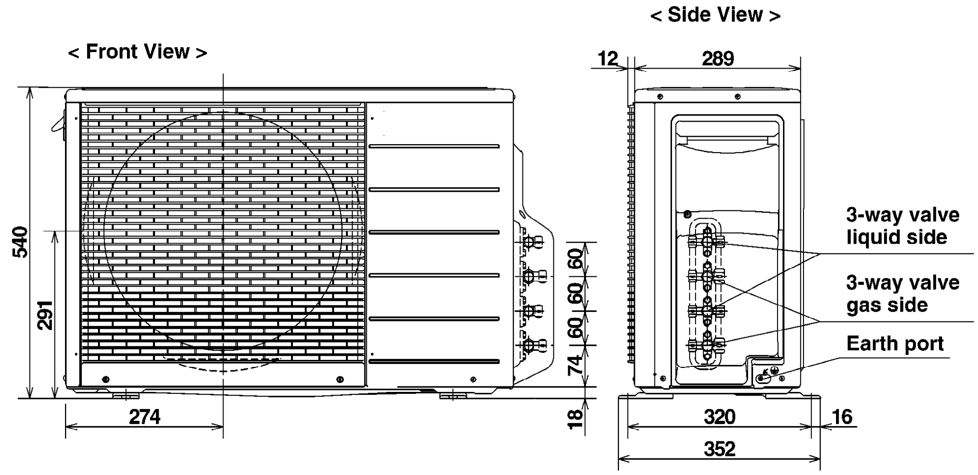

29
Gas side
Liquid side
Drain hose
Drain port
(320)
(57)
(87)
(425)

Relative position between the indoor unit and the installation plate < Front View >

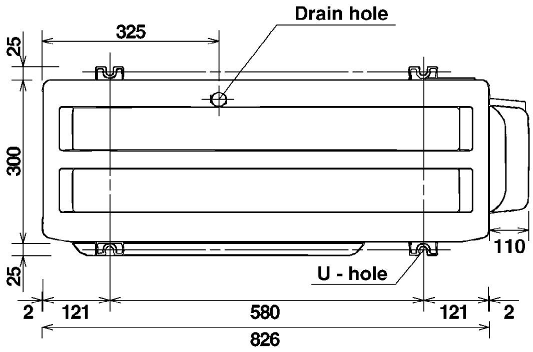

385
385
315
135
250
37
59
Indoor unit external dimention line
54
Installation plate
Slot
221
50
120
46
Right piping hole
233 Liquid side
293 Gus side
Cutting point
of left pipe
60
325
305
80

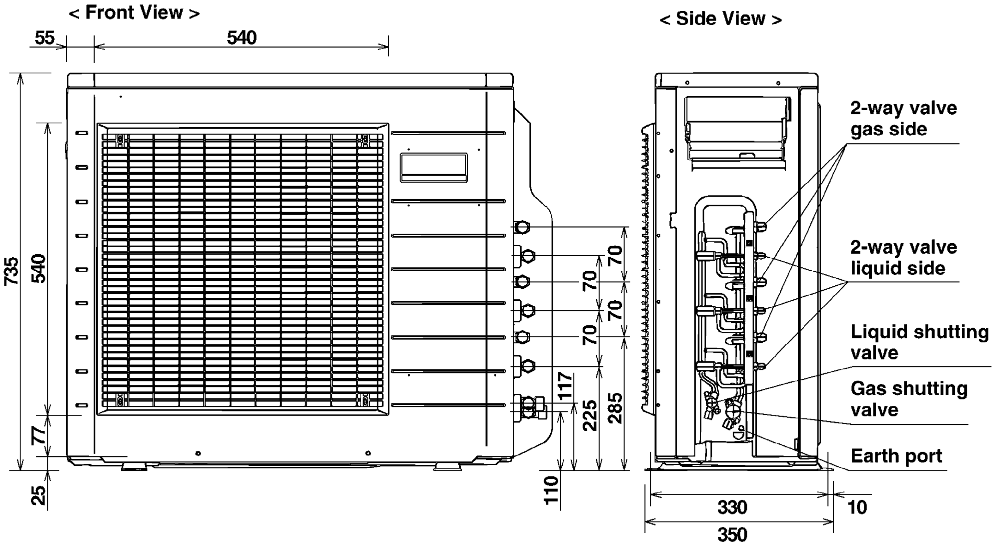
5.2. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)


Drain hole
U - hole
394
45. 5
34. 5
162. 5
27. 5
289
105
570
105
57
24. 5
780
70

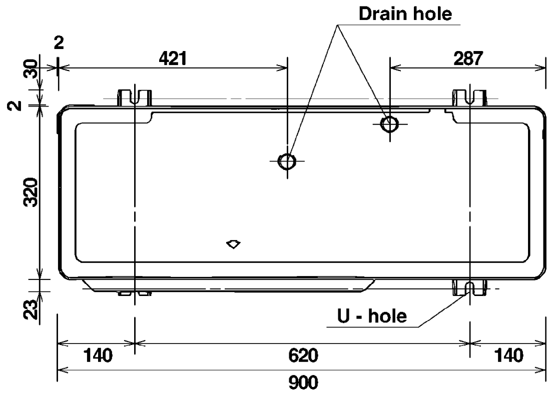

< Front View >
< Side View >
540
291
274
60
60
60
74
18
12
289
3-way valve
liquid side
3-way valve
gas side
Earth port
320
16
352

5.3. OUTDOOR UNIT (CU-3E23CBPG)

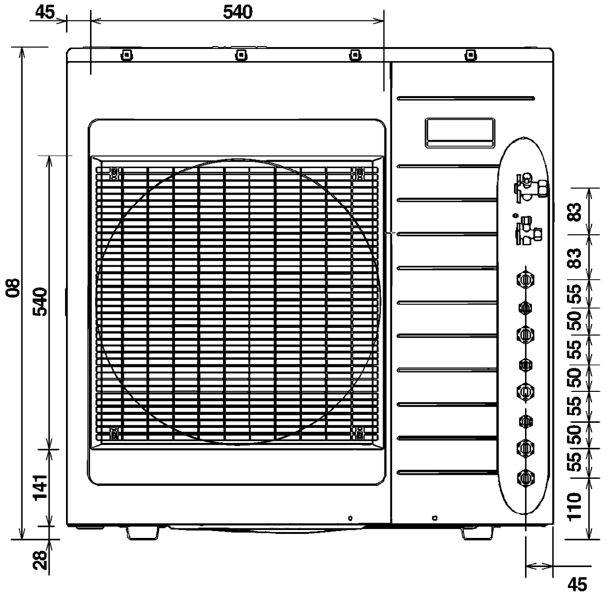

Drain hole
325
25
300
25
110
U - hole
2
121
580
121
2
826


< Front View >
55
540
735
540
77
25
70
70
70
70
70
117
225
285
110
< Side View >
2-way valve gas side
2-way valve liquid side
Liquid shutting valve
Gas shutting valve
Earth port
330
10
350

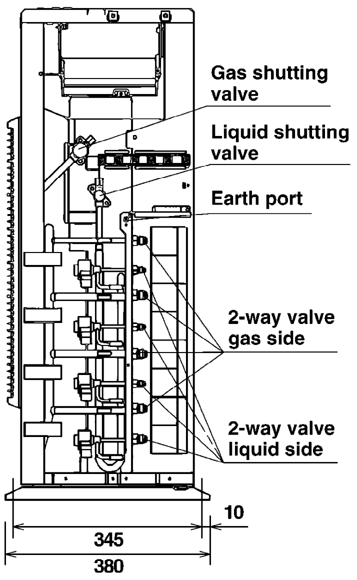
5.4. OUTDOOR UNIT (CU-4E27CBPG)


Drain hole
2
421
287
30
2
320
23
U - hole
140
620
140
900

< Front View >

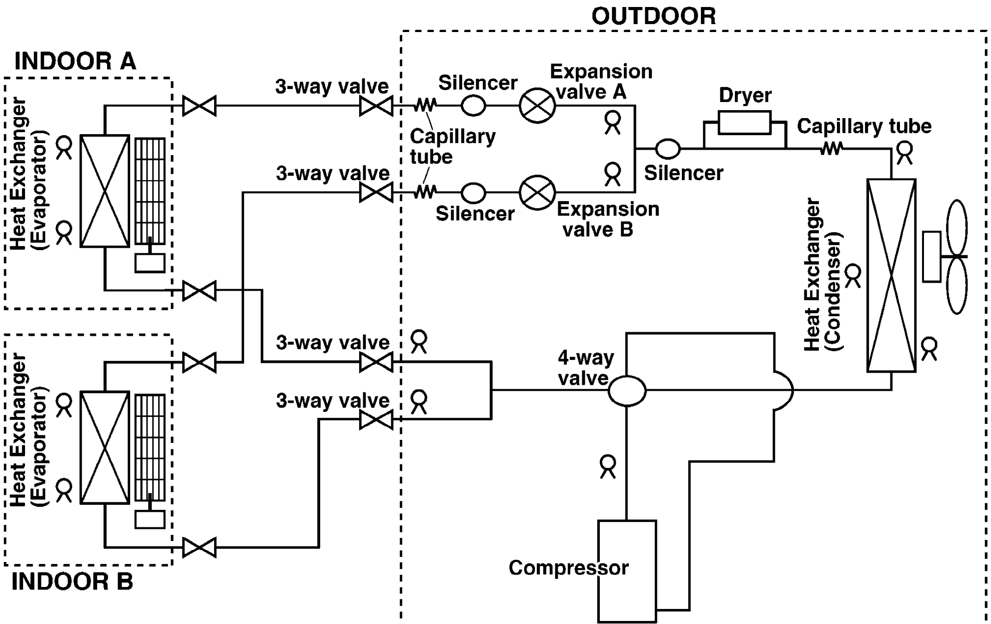

45
540
540
141
28
83
83
55
50
55
50
55
50
55
110
45

< Side View >


Gas shutting valve
Liquid shutting valve
Earth port
2-way valve gas side
2-way valve liquid side
10
345
380

6. Refrigeration Cycle Diagram

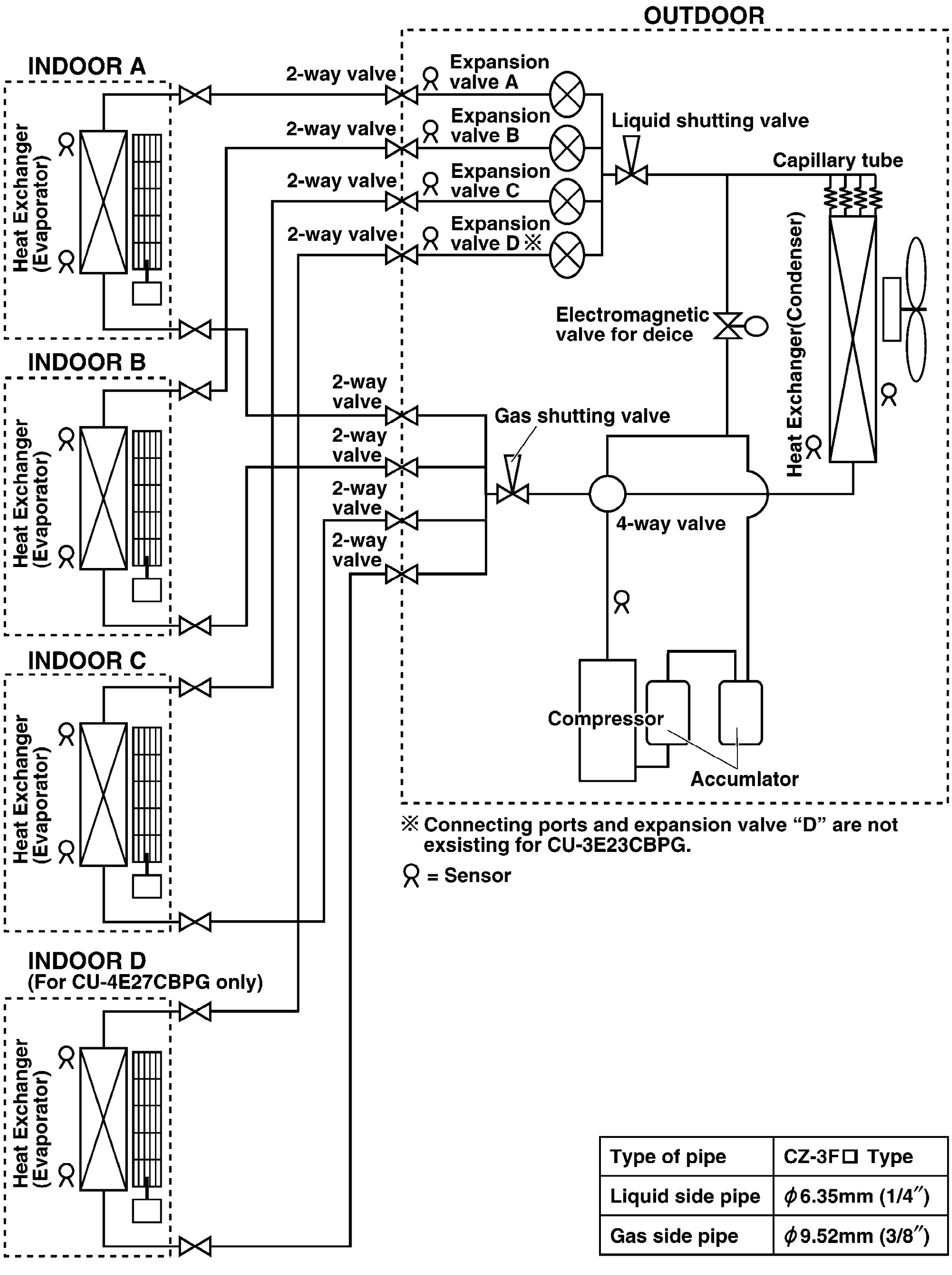
6.1. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)


OUTDOOR
INDOOR A
Heat Exchanger (Evaporator)
3-way valve
Silencer
Expansion valve A
Dryer
Capillary tube
Capillary tube
3-way valve
Silencer
Silencer
Expansion valve B
Heat Exchanger (Condenser)
3-way valve
3-way valve
4-way valve
Heat Exchanger (Evaporator)
Compressor
INDOOR B

Type of pipe	CZ-3F□ Type
Liquid side pipe	φ6.35mm (1/4″)
Gas side pipe	φ9.52mm (3/8″)

Ω = Sensor

6.2. OUTDOOR UNIT (CU-3E23CBPG/CU-4E27CBPG)


OUTDOOR
INDOOR A
INDOOR B
INDOOR C
INDOOR D
(For CU-4E27CBPG only)
Heat Exchanger (Evaporator)
2-way valve
Expansion valve A
Expansion valve B
Expansion valve C
Expansion valve D ※
Liquid shutting valve
Capillary tube
Electromagnetic valve for deice
Heat Exchanger(Condenser)
Gas shutting valve
4-way valve
Compressor
Accumlator

※ Connecting ports and expansion valve "D" are not exsisting for CU-3E23CBPG.

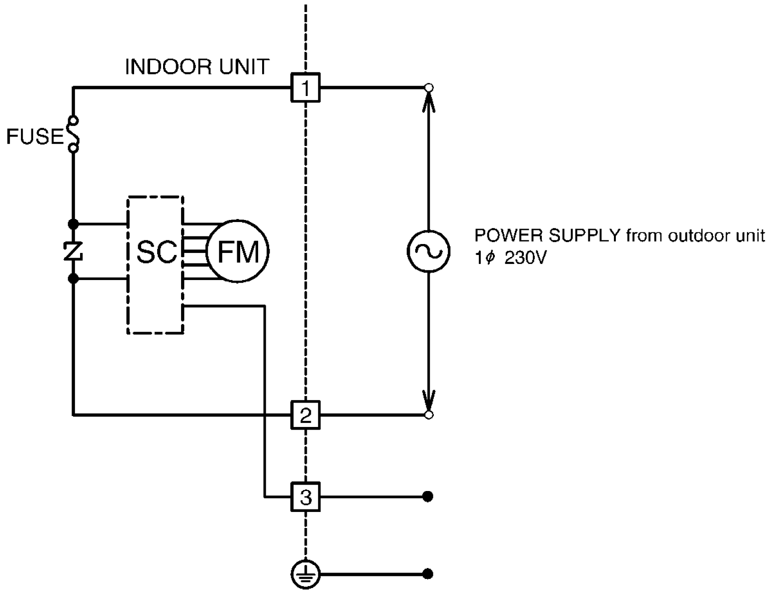
Ω = Sensor

Type of pipe	CZ-3F☐ Type
Liquid side pipe	ϕ6.35mm (1/4″)
Gas side pipe	ϕ9.52mm (3/8″)

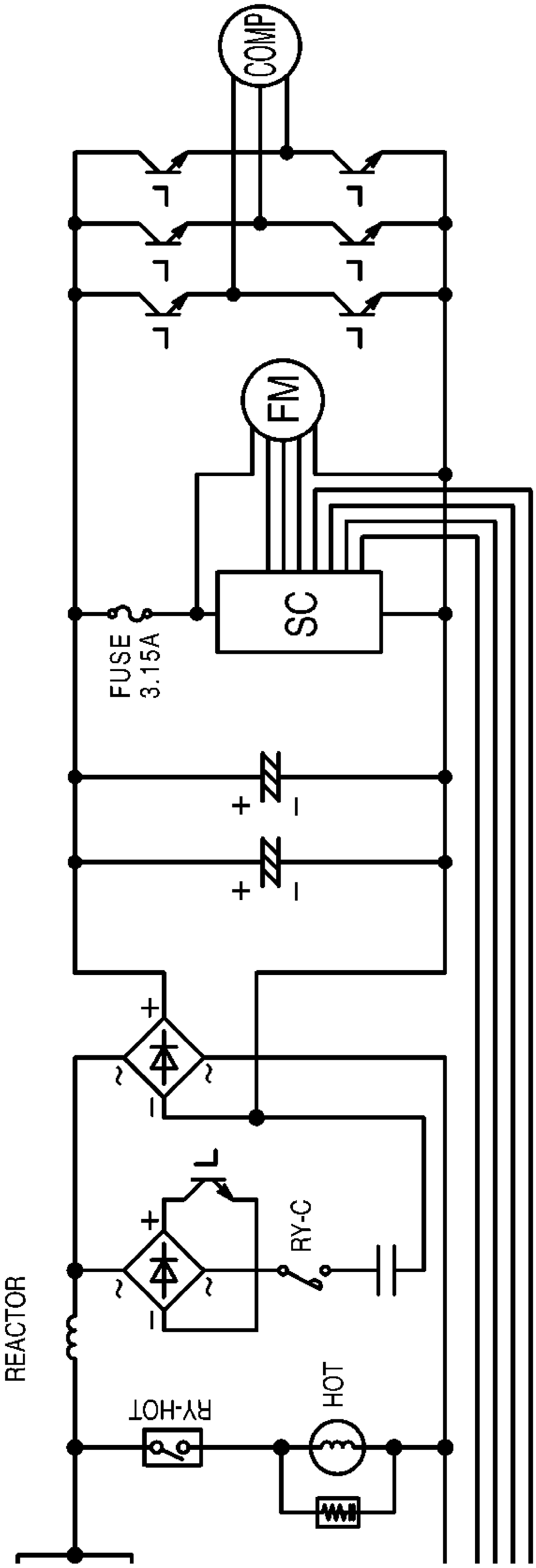
7. Block Diagram

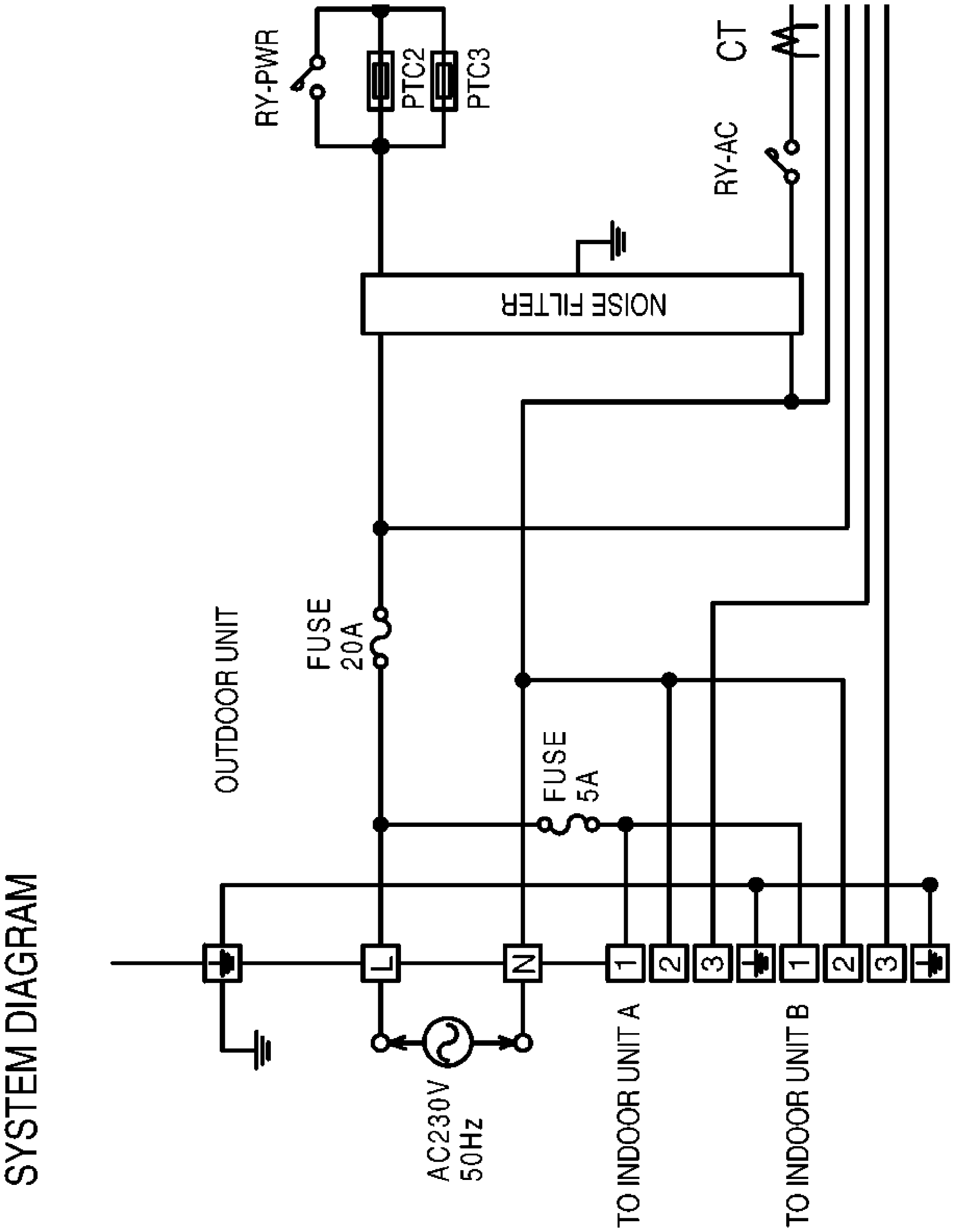
7.1. INDOOR UNIT

FOR OUTDOOR UNITSW'S SYSTEM DIAGRAM.
REFER TO OUTDOOR CONNECTING DIAGRAM.


INDOOR UNIT
FUSE
Z
SC
FM
1
2
3
POWER SUPPLY from outdoor unit
1ϕ 230V

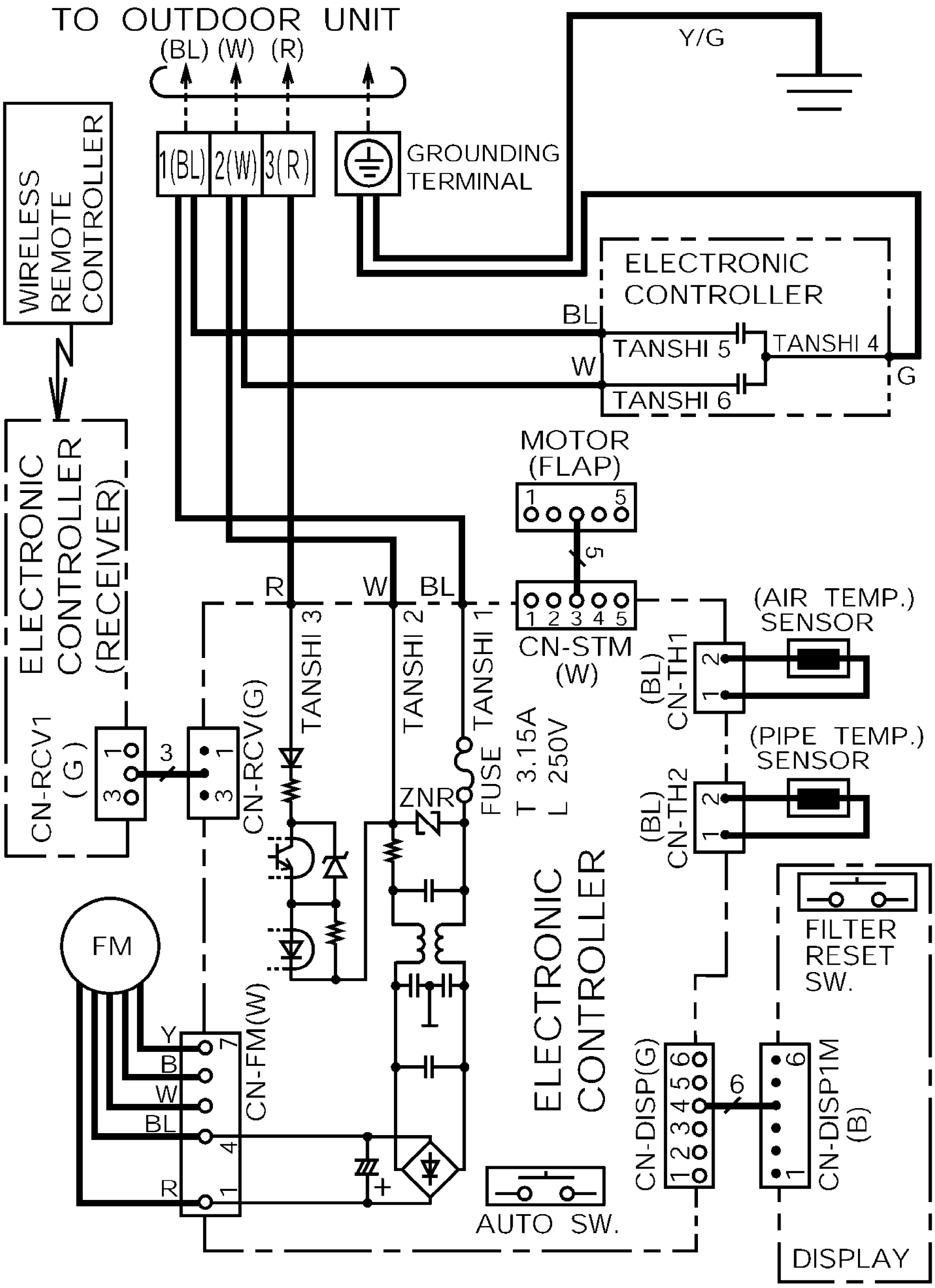
7.2. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)


COMP
FM
SC
FUSE
3.15A
REACTOR
RY-HOT
HOT
RY-C


SYSTEM DIAGRAM
OUTDOOR UNIT
AC230V
50Hz
L
N
FUSE
20A
FUSE
5A
RY-PWR
PTC2
PTC3
NOISE FILTER
RY-AC
CT
1
2
3
1
2
3
TO INDOOR UNIT A
TO INDOOR UNIT B

8. Wiring Diagram

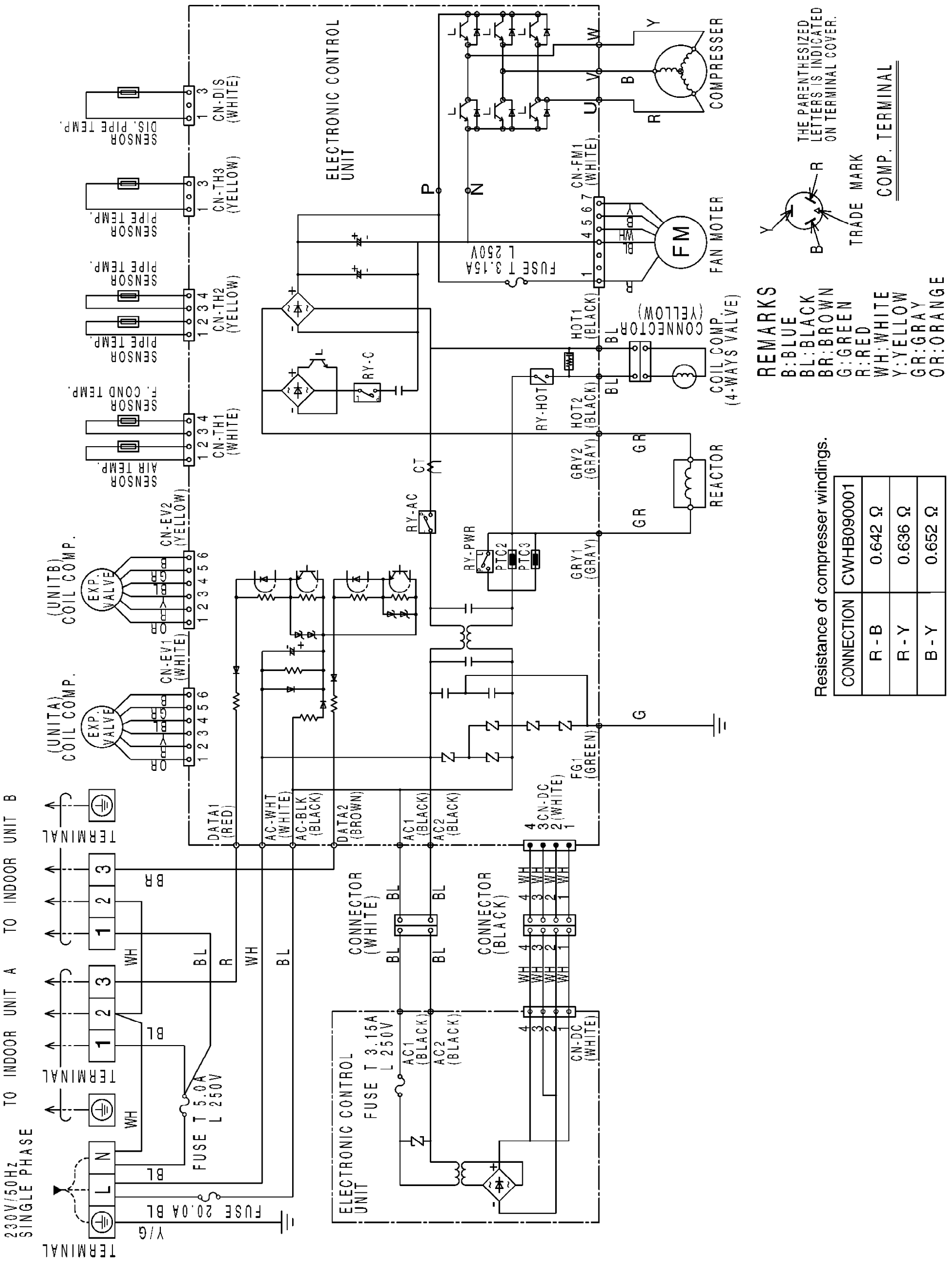
8.1. INDOOR UNIT


TO OUTDOOR UNIT
(BL) (W) (R)
Y/G
1(BL) 2(W) 3(R)
GROUNDING TERMINAL
WIRELESS REMOTE CONTROLLER
ELECTRONIC CONTROLLER
BL
TANSHI 5
TANSHI 4
W
TANSHI 6
G
MOTOR (FLAP)
1 5
5
ELECTRONIC CONTROLLER (RECEIVER)
R
W
BL
TANSHI 3
TANSHI 2
TANSHI 1
1 2 3 4 5
CN-STM (W)
(AIR TEMP.) SENSOR
(BL) CN-TH1
1 2
(PIPE TEMP.) SENSOR
(BL) CN-TH2
1 2
CN-RCV1 (G)
1 3
3
CN-RCV(G)
1 3
ZNR
FUSE T 3.15A L 250V
ELECTRONIC CONTROLLER
FILTER RESET SW.
FM
Y
B
W
BL
R
7
4
1
CN-FM(W)
+
AUTO SW.
CN-DISP(G)
1 2 3 4 5 6
6
CN-DISP1M (B)
1 6
DISPLAY

REMARKS

B:BLUE BR:BROWN W:WHITE G:GREEN
P:PINK Y:YELLOW O:ORANGE GRY:GRAY
BL:BLACK R:RED Y/G:YELLOW/GREEN
VLT:VIOLET

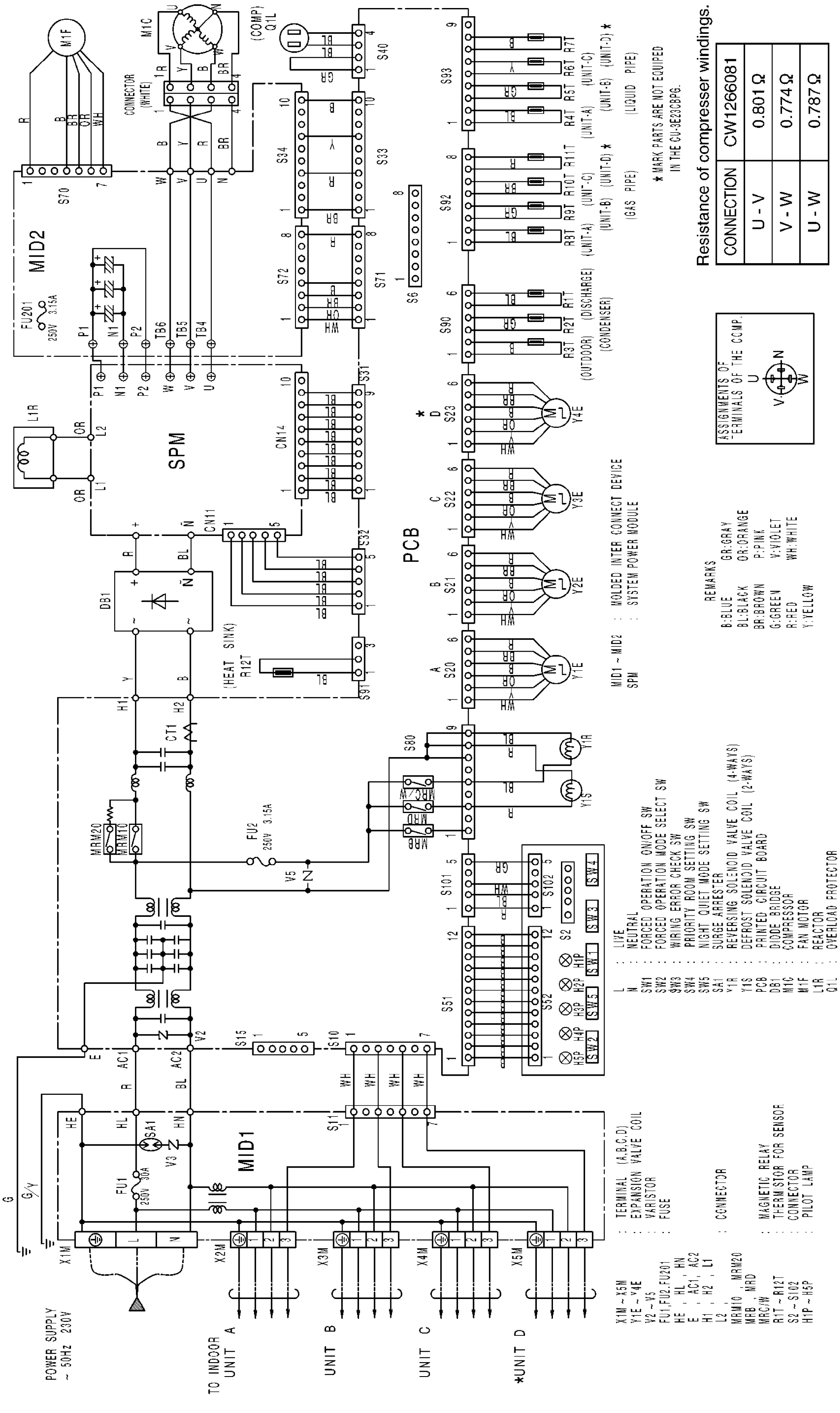
8.2. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)


TERMINAL
230V/50Hz SINGLE PHASE
TO INDOOR UNIT A
TO INDOOR UNIT B
Y/G
FUSE 20.0A
FUSE T 5.0A L 250V
ELECTRONIC CONTROL UNIT
FUSE T 3.15A L 250V
AC1 (BLACK)
AC2 (BLACK)
CN-DC (WHITE)
CONNECTOR (WHITE)
CONNECTOR (BLACK)
DATA1 (RED)
AC-WHT (WHITE)
AC-BLK (BLACK)
DATA2 (BROWN)
FG1 (GREEN)
(UNITA) COIL COMP.
(UNITB) COIL COMP.
EXP. VALVE
CN-EV1 (WHITE)
CN-EV2 (YELLOW)
SENSOR AIR TEMP.
SENSOR F. COND TEMP.
CN-TH1 (WHITE)
SENSOR PIPE TEMP.
CN-TH2 (YELLOW)
CN-TH3 (YELLOW)
SENSOR DIS. PIPE TEMP.
CN-DIS (WHITE)
RY-C
RY-AC
CT
RY-PWR
PTC2
PTC3
RY-HOT
GRY1 (GRAY)
GRY2 (GRAY)
HOT2 (BLACK)
HOT1 (BLACK)
REACTOR
COIL COMP. (4-WAYS VALVE)
CONNECTOR (YELLOW)
FUSE T 3.15A L 250V
CN-FM1 (WHITE)
FAN MOTER
FM
COMPRESSER
P
N
U
V
W
TRADE MARK
COMP. TERMINAL
THE PARENTHESIZED LETTERS IS INDICATED ON TERMINAL COVER.
REMARKS
B:BLUE
BL:BLACK
BR:BROWN
G:GREEN
R:RED
WH:WHITE
Y:YELLOW
GR:GRAY
OR:ORANGE

Resistance of compresser windings.

CONNECTION	CWHB090001
R - B	0.642 Ω
R - Y	0.636 Ω
B - Y	0.652 Ω

8.3. OUTDOOR UNIT (CU-3E23CBPG/CU-4E27CBPG)


M1F
M1C
(COMP)
Q1L
MID1
MID2
SPM
PCB
DB1
L1R
CT1
SA1
FU1 250V 30A
FU2 250V 3.15A
FU201 250V 3.15A
MRM10
MRM20
MRB
MRD
MRC/W
S20
S21
S22
S23
S33
S34
S40
S51
S52
S70
S71
S72
S80
S90
S91
S92
S93
S101
S102
CN11
CN14
(HEAT SINK) R12T
R1T (DISCHARGE)
R2T (CONDENSER)
R3T (OUTDOOR)
R4T R5T R6T R7T (UNIT-A) (UNIT-B) (UNIT-C) (UNIT-D) (LIQUID PIPE)
R8T R9T R10T R11T (UNIT-A) (UNIT-B) (UNIT-C) (UNIT-D) (GAS PIPE)
★ MARK PARTS ARE NOT EQUIPED IN THE CU-3E23CBPG.
Y1E
Y2E
Y3E
Y4E
Y1R
Y1S
SW1
SW2
SW3
SW4
SW5
H1P
H2P
H3P
H4P
H5P
X1M
X2M
X3M
X4M
X5M
POWER SUPPLY ~50Hz 230V
TO INDOOR UNIT A
UNIT B
UNIT C
★UNIT D
ASSIGNMENTS OF TERMINALS OF THE COMP.
X1M~X5M : TERMINAL (A,B,C,D)
Y1E~Y4E : EXPANSION VALVE COIL
V2~V5 : VARISTOR
FU1,FU2,FU201 : FUSE
HE, HL, HN, E, AC1, AC2, H1, H2, L1, L2 : CONNECTOR
MRM10, MRM20, MRB, MRD, MRC/W : MAGNETIC RELAY
R1T~R12T : THERMISTOR FOR SENSOR
S2~S102 : CONNECTOR
H1P~H5P : PILOT LAMP
L : LIVE
N : NEUTRAL
SW1 : FORCED OPERATION ON/OFF SW
SW2 : FORCED OPERATION MODE SELECT SW
SW3 : WIRING ERROR CHECK SW
SW4 : PRIORITY ROOM SETTING SW
SW5 : NIGHT QUIET MODE SETTING SW
SA1 : SURGE ARRESTER
Y1R : REVERSING SOLENOID VALVE COIL (4-WAYS)
Y1S : DEFROST SOLENOID VALVE COIL (2-WAYS)
PCB : PRINTED CIRCUIT BOARD
DB1 : DIODE BRIDGE
M1C : COMPRESSOR
M1F : FAN MOTOR
L1R : REACTOR
Q1L : OVERLOAD PROTECTOR
MID1~MID2 : MOLDED INTER CONNECT DEVICE
SPM : SYSTEM POWER MODULE
REMARKS
B:BLUE
BL:BLACK
BR:BROWN
G:GREEN
R:RED
Y:YELLOW
GR:GRAY
OR:ORANGE
P:PINK
V:VIOLET
WH:WHITE

Resistance of compresser windings.

CONNECTION	CW1266081
U - V	0.801 Ω
V - W	0.774 Ω
U - W	0.787 Ω

9. Operation Details (Functions & Protection)

9.1. INDOOR UNIT OPERATION

9.1.1. Simultaneous Operation Control

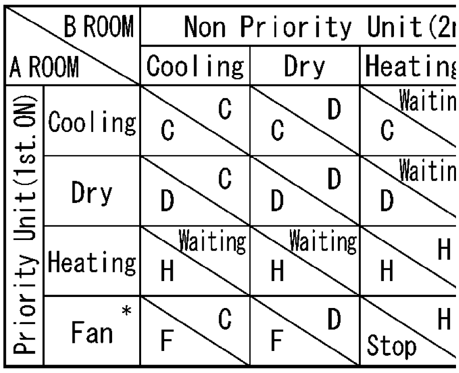
1. Operation modes which can be selected using the remote control unit:
Automatic, Cooling, Dry, Heating, Fan operation mode.
2. Types of operations modes which can be performed simultaneously

-Cooling operation and cooling, dehumidifying or fan operation
-Heating operation and heating operation
3. Types of operation modes which cannot be performed simultaneously

-While a cooling operation is in progress, a heating operation cannot be performed by an indoor unit in another room.
In the room where the operation button for cooling was pressed first, the operation is continued. In the room where the operation button for heating was pressed afterward, the operation lamp of the indoor unit blinks, where the attempt is made to establish the heating operation. Its fan is stopped, and the air does not discharged.
-While a heating operation is in progress, a cooling operation cannot be performed by an indoor unit in another room.
In the room where the operation button for heating was pressed first, operation is continued. In the room where the operation button for cooling was pressed afterward, the operation lamp of the indoor unit blinks, where the attempt is made to establish the cooling operation. Its fan is stopped, and the air does not discharged.
4. Operation mode priority control

-The operation mode designated first by the indoor unit has priority.
-If the priority indoor unit stops operation or initiates the fan operation, the priority is transferred to other indoor units.

"Waiting" denotes the standby statu
the operation lamp LED blinks (ON fo
and OFF for 0.5 sec.), and the fan is s



	B ROOM A ROOM	Non Priority Unit(2n		
		Cooling	Dry	Heatin
Priority Unit(1st.ON)	Cooling	C C	D C	Waitin C
	Dry	C D	D D	Waitin D
	Heating	Waiting H	Waiting H	H H
	Fan *	C F	D F	H Stop

* In the fan mode, priority is transferr
non-priority unit.

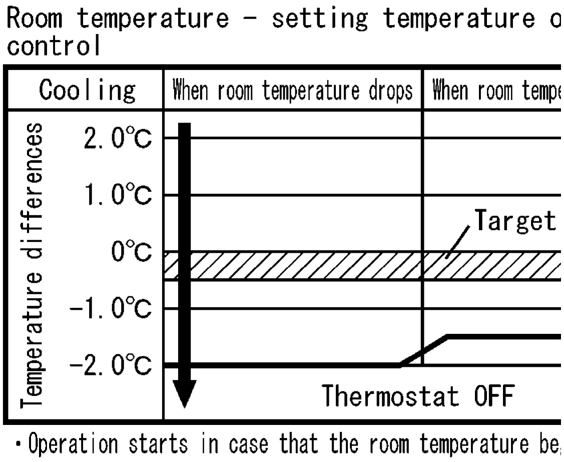
Note
C: Cooling operation mode
D: Dry operation mode
H: Heating operation mode
F: Fan operation mode

9.1.2. Room Temperature Control (Compressor Control)

The room temperature is adjusted by changing the compressor's operation frequency in response to the difference between setting temperature of remote control unit and the room temperature (intake air temperature sensor).

9.1.2.1. Cooling Operation

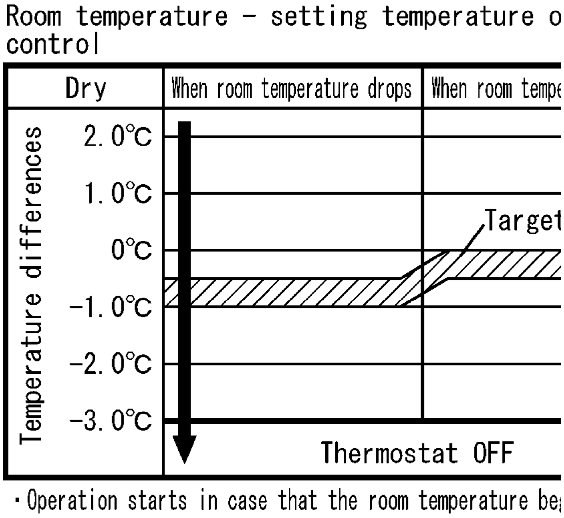
- **Thermostat OFF temperature = setting temperature of remote control - 2 °C**
- **Thermostat ON temperature = setting temperature of remote control - 1.5 °C or higher**
- **Thermostat goes OFF when the intake air temperature drops below the thermostat OFF temperature.**



9.1.2.2. Dry Mode Operation

9.1.2.2.1. Dry Mode Operation (Applicable Intake Temperature: 15 °C or Higher)

- **Thermostat OFF temperature = setting temperature of remote control - 3 °C**
- **Thermostat ON temperature = setting temperature of remote control - 2.5 °C or higher**
- **Thermostat goes OFF when the intake air temperature drops below the thermostat OFF temperature.**
- **When the thermostat OFF temperature is approached, the operation mode is switched to the dry mode operation (low-frequency operation, SLo fan speed).**

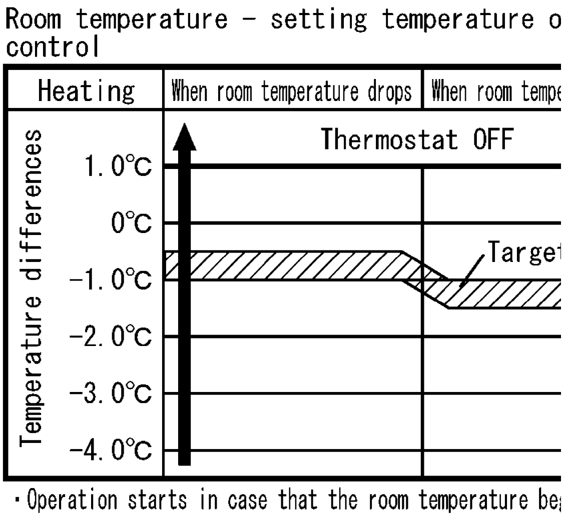


9.1.2.3. Heating Operation

-Thermostat OFF temperature = setting temperature of remote control + 1.5 °C

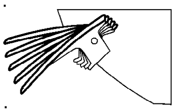
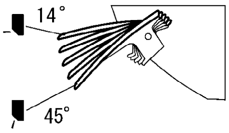
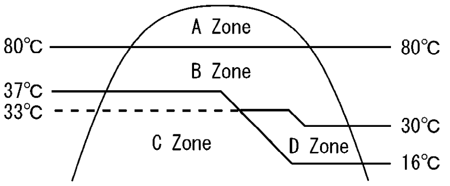
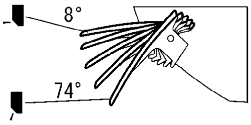
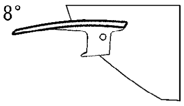
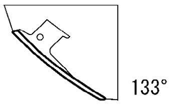
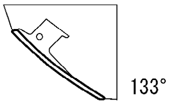
-Thermostat ON temperature = setting temperature of remote control + 1.0 °C or lower

-The maximum frequency operation is delivered when operation has continued for 3 minutes at the rated frequency operation.



9.1.3. Airflow direction Control

The vertical airflow direction louver is controlled as shown in the table below in response to the operation of the remote control air swing button and the operating conditions.

Condition			Normal operation	
Cooling or dry	Automatic airflow direction	Fixed air swing angle	Upper limit: 14°  Lower limit: 45°	• When the automatic airflow direction is set using the remote control unit, the louver swing at a fixed angle through the 5 angle positions. . • When the indoor unit fan has stopped, the louver does not swing (It is fixed at the upper limit angle position).
	Airflow direction setting	Selectable 5 angle positions using remote control.		• When the airflow direction is set using the remote control, the vertical airflow direction louver is fixed at one of the 5 angle position.
Heating	Automatic airflow direction			**Louver Angle** A = 8° B = 57° (CS-ME14/18CKPG) = 65° (CS-ME7/10/12CKPG) C = 8° D = close(133°)
	Airflow direction setting	Selectable 5 angle positions using remote control unit.		• When the airflow direction is set using the remote control unit, the vertical airflow direction louver is fixed at one of the 5 angle position.
Odour wash			Cooling・Dry 	Heating 
Stopping				

- When the air conditioner is operated using the remote control, the vertical airflow direction louvers first open, and then move to the angle position which has been set.
- When the power has been turned off during operation, the operation stop with the vertical airflow louver left open.
- Horizontal airflow direction louvers are operated manually. Set them manually to the desired position.

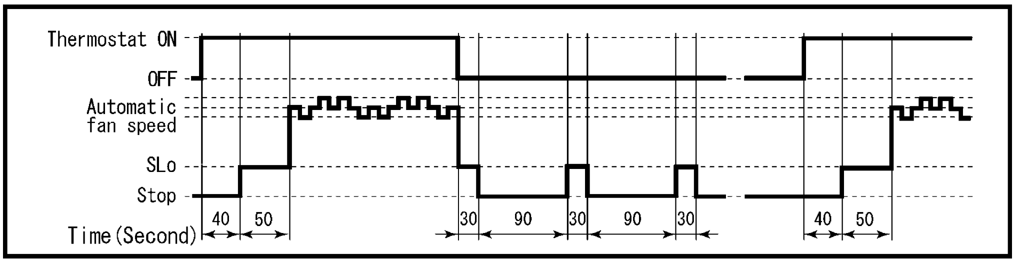
9.1.4. Indoor Fan Control

- Depending on the airflow selector button setting of the remote control unit and the operating conditions, the operations for indoor fan control are as shown in the table below.
- Airflow control may be at variance from the airflow which has been set.

9.1.4.1. Cooling Operation

1. Automatic fan speed

   This air conditioner comes with a odour removing function. When operation starts or the thermostat is set ON, the fan stops for 40 seconds. This is done in order to clean off the odour components which have accumulated on the heat exchanger using the moisture produced by dehumidification.



2. Maximum cooling capacity

   When, in order to lower the room temperature quickly for the high cooling load, the fan speed is set to high and the temperature setting is 16 °C, the fan speed is boosted for the first 30 minutes after operation is commenced. (Fan speed will be shifted to "SHi".)

3. Anti-dew formation control

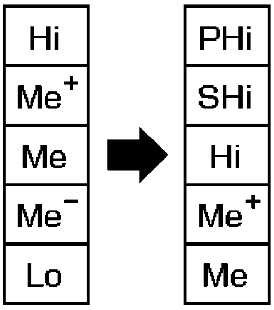
   When the anti-dew formation control is activated, the fan speed is lowered. (In door fan speed approaches the "Me".)

4. Anti-freezing control

   When the temperature of the indoor unit heat exchanger drops to below 8 °C, the fan speed is boosted by two steps. When it exceeds 14 °C, fan speed is returned to setting.

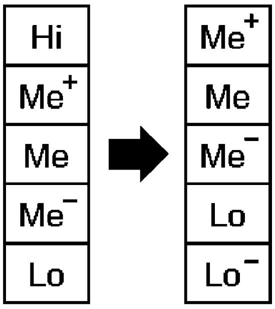
5. Powerful mode operation control
   At the automatic fan speed setting, operation is transferred to the automatic powerful fan speed setting. At the manual fan speed setting, the fan speed is boosted by two steps.

(In case of manual fan speed setting.)



6. Quiet mode operation control
   At the automatic fan speed setting, operation is transferred to the automatic quiet mode fan speed setting. At the manual fan speed setting, the fan speed is reduced by one step.

(In case of manual fan speed setting.)



7. Forced cooling operation
   When AUTO button of the indoor unit is pressed for 5 seconds, the forced cooling operation is started with high fan speed.

8. Auto operation
   Operation is performed at the automatic fan speed when operation is initiated using the auto operation button or when a cooling operation has been initiated using the remote control when a diagnostic display for the kind of trouble by which auto operation is enabled has appeared.

9.1.4.2. Dry Mode Operation

1. Basic fan speed

In the cooling zone, the fan speed for cooling operations is used. When it reaches into the dry mode zone, operation is performed at the SLo fan speed.

2. **Automatic fan speed**

   During the thermostat OFF period, a stop of 90 seconds and SLo operation for 20 seconds are repeated. When operation starts and while the thermostat is ON, the fan is stopped for 40 seconds.

9.1.4.3. Heating Operation

1. **Hot start/anti cold draft control**

   When operation starts, the fan is stopped if the temperature of the indoor unit heat exchanger is low. The “POWER” indication lamp blinks at this time. As the temperature of the heat exchanger rises, the fan speed is boosted to prevent discharging the cold air.

2. **Automatic fan speed**

   When the automatic fan speed is selected, fan speed is determined by the difference between the room temperature and setting temperature of remote control and by heat exchanger temperature. However, when the temperature of the heat exchanger is low, operation is conducted at the hot start/anti-cold draft control fan speed.

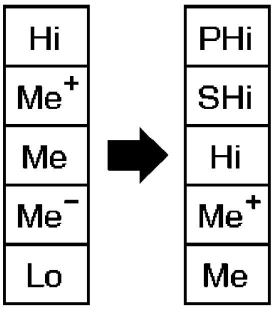
3. **Thermostat OFF**

   When the thermostat is OFF, the fan's operation is restricted based on the temperature of the heat exchanger.

4. **Powerful operation**

   At the automatic fan speed setting, operation is transferred to the automatic powerful fan speed. At the manual fan speed setting, the fan speed is boosted by two steps.

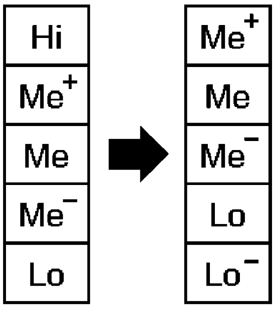
(In case of manual fan speed setting.)



5. **Quiet mode control**

At the automatic fan speed setting, operation is transferred to the automatic quiet mode fan speed. At the manual airflow setting, the fan speed is reduced by one step.

(In case of manual fan speed setting.)



6. Forced heating operation

When AUTO button of the indoor unit is pressed for 8 seconds, the forced heating operation is started with SHi fan speed. However, when the temperature of the heat exchanger is low, operation is conducted at the hot start/anti-cold draft control fan speed.

7. Auto operation

Operation is performed at the automatic fan speed when operation is initiated using the auto operation button or when a heating operation has been initiated using the remote control unit when a diagnostic display for the kind of trouble by which auto operation is enabled has appeared. However, when the temperature of the heat exchanger is low, operation is conducted at the hot start/anti-cold draft control fan speed.

9.1.5. Automatic Operation

- The operation mode (cooling, dry or heating) is selected automatically.
- The operation mode is first selected when operation starts and re-selected after each 3-hours period. The temperature, fan speed and airflow direction are set using the remote control.

9.1.5.1. Selecting the Operation Mode

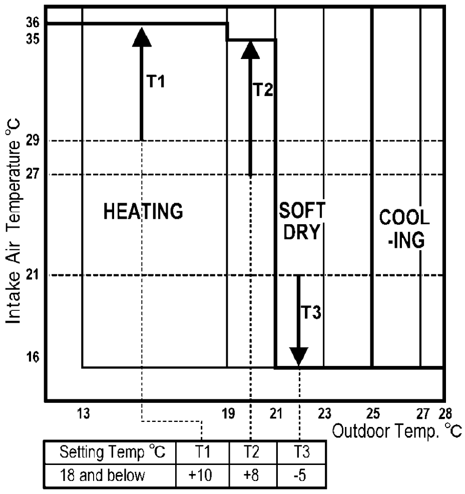
When the Automatic mode is selected, the operation mode is decided in accordance to remote control setting temperature, intake air temperature and outdoor air temperature.

- During judging the operation mode, indoor fan is running at Lo-speed and outdoor fan at ON in order to sense the indoor intake air temperature and outdoor air temperature for 20 seconds. At

this time, Power LED is blinking. After the operation mode is selected, Power LED light up.

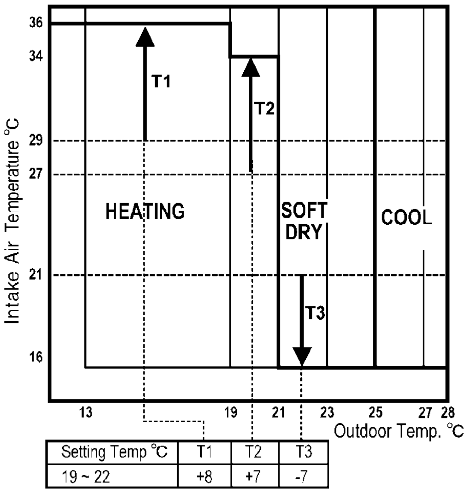
There are 4 determination charts when automatic mode is selected.

(A) When setting temperature of remote control is 18 °C and below



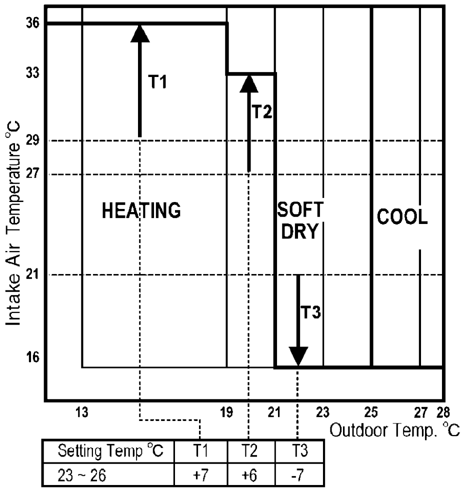
Setting Temp °C	T1	T2	T3
18 and below	+10	+8	-5

(B) When setting temperature of remote control is 19 °C ~ 22 °C



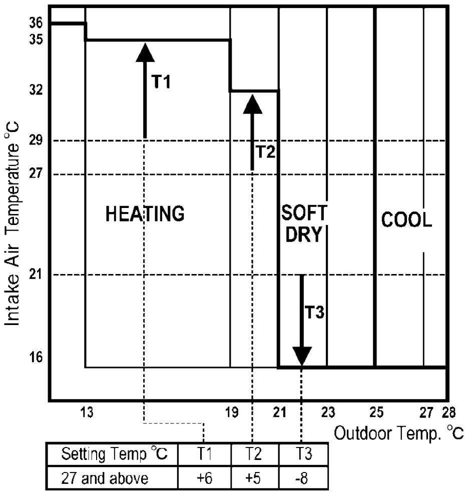
Setting Temp °C	T1	T2	T3
19 ~ 22	+8	+7	-7

(C) When setting temperature of remote control is 23 °C ~ 26 °C



Setting Temp °C	T1	T2	T3
23 ~ 26	+7	+6	-7

(D) When setting temperature of remote control is 27 °C and above



Setting Temp °C	T1	T2	T3
27 and above	+6	+5	-8

Setting temp ˚C	T1	T2	T3
18 and below	+10	+8	-5
19 - 22	+8	+7	-7
23 - 26	+7	+6	-7
27 and above	+6	+5	-8

Note:

Base temperature for T1 is 29 ˚C

Base temperature for T2 is 27 ˚C

Base temperature for T3 is 21 ˚C

- When the operation mode is changed over, the value for t1, t2 and t3 are shifted as follows:

Cooling/Soft dry → Heating: -2 °C

Heating → Cooling/Soft dry: +2 °C

- **When the indoor intake air temperature is lower than 16 °C, heating operation is immediately started.**
- **When the outdoor air temperature is more than 25 °C, and the intake air temperature is over 16 °C, cooling operation is immediately started.**
- **The operation mode is judged every 3 hours.**

9.1.5.2. Temperature Shift

- **When the operation mode (Heating, Cooling or Soft Dry) is decided, the internal setting temperature will shift as shown below:**

Remote Control setting tempareture

+

Indoor and Outdoor temperature shift

+

Sleep mode shift

+

Cooling	+1.5 °C
Soft Dry	+1.0 °C
Heating	+2.0 °C

↓

INTERNAL SETTING TEMPERATURE

9.1.6. Sleep Timer / Sleep Operation Mode

- **When the sleep timer is set using the remote control, the air conditioner will stop after the set time (1, 2, 3, 5 or 7 hours) has elapsed.**
  Remaining time of the remote control unit is displayed in 1-hour increments. When the set time is reached, the remaining time display is cleared.

- When the sleep timer is set to 5 or 7 hours, sleep mode operation is activated after 3 hours.

- When the sleep mode operation is activated, the compressor operation frequency and outdoor fan speed are reduced to quiet down the noise of the outdoor unit.

1. Sleep mode operation during a cooling operation

- **The indoor unit fan speed is shift to Lo-.**
- **The setting temperature is boosted by 0.5 °C. It is boosted by a further 0.5 °C if the outdoor air temperature drops below 27 °C after one hour has elapsed. However, this temperature shift is not performed if the setting temperature of remote control is above 28 °C.**

2. Sleep mode operation during a dry mode operation

- **The setting temperature is not shifted.**

3. Sleep mode operation during a heating operation

- **The indoor unit fan speed is set to Lo-.**
- **The setting temperature is lowered by 1 °C. It is lowered by a further 1 °C after one hour has elapsed.**

9.1.7. Timer Operation

Delay ON/OFF timer

- In accordance with the air-conditioning load, the preparatory operation is performed so that the setting temperature will be reached at the set time. The preparatory operation period is fixed as shown in the table below.

- 60 minutes before the set time, the indoor fan operates at SLo and outdoor fan operates for 30 seconds to sample the indoor intake air temperature and outdoor air temperature in order to determine the starting time for preparatory operation. (Operation LED blinks. Timer LED lights.)

- The fan speed and air direction during the preparatory operation are based on the remote control settings (same as with normal operation). However, at the automatic airflow setting, the fan speed setting is never raised above "Lo".

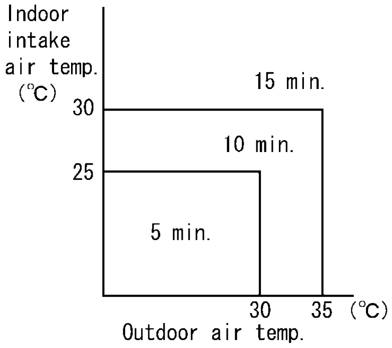
- Timer setting method

Delay ON timer	**Type**	**Set time**	
	Setting range	**0 : 00 - 23 : 50**	
	Increment	**10 minutes**	
	preparatory operation	●	
	Daily function	●	
Delay OFF timer	**Type**	**Set time**	**Single action**
	Setting range	**0 : 00 - 23 : 50**	**1, 2,3, 5 or 7 hours**
	Interval	**10 minutes**	**---**
	preparatory operation	**---**	**---**

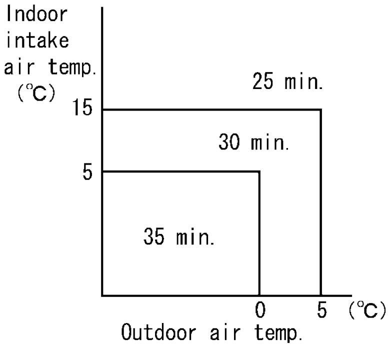
- During the preparatory operation, the compressor operation frequency and outdoor fan speed are reduced to reduce the noise of the outdoor unit.

- Delay ON timer preparatory operation time

1. Cooling Dry



2. Heating



9.1.8. Filter Cleaning Indicator

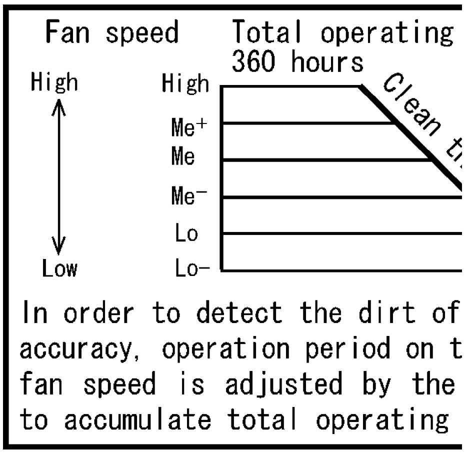
-The blinking filter lamp warns the user that the air filter is dirty. When the air conditioner has operated for a total of 360 hours or so, this lamp blinks during cooling and heating operation and stop.

-The blinking filter lamp is turned off by pressing the filter reset button.

-The total operating time of the air conditioner is stored in the memory after each hour elapses.
(Operation is detected by the change in the fan speed of the indoor unit fan motor.)

-The total operating time data in the memory is not erased even when the power is turned off.

-The time can be reset by the remote control unit even during stopping.



In order to detect the dirt of accuracy, operation period on t fan speed is adjusted by the to accumulate total operating

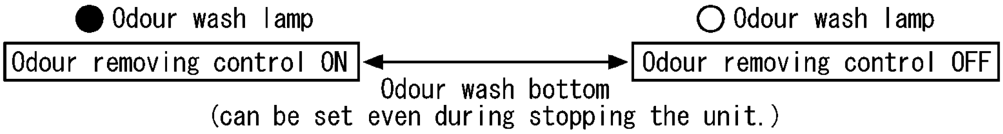
9.1.9. Odour Wash Operation

- The odour particles which have accumulated on the heat

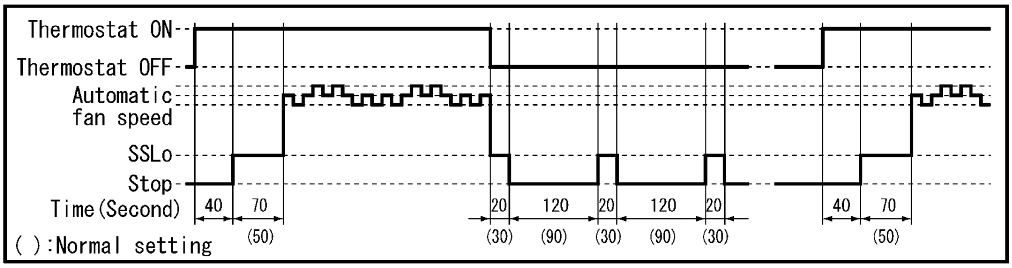
exchanger during fan and heating operations are volatilized and cleaned off.

9.1.9.1. Odour Removing Mode Operation (In Season)

- Whether the odour removing mode is ON or OFF is indicated by the odour wash lamp which is lighted or off.


● Odour wash lamp
○ Odour wash lamp
Odour removing control ON
Odour removing control OFF
Odour wash bottom
(can be set even during stopping the unit.)

- This function works during cooling and dry mode operations at the automatic fan speed setting performed in season.

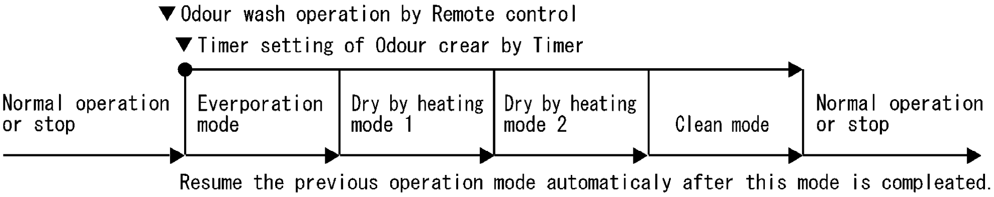

Thermostat ON
Thermostat OFF
Automatic fan speed
SSLo
Stop
Time(Second)
40
70
20
120
20
120
20
40
70
( ):Normal setting
(50)
(30)
(90)
(30)
(90)
(30)
(50)

＊ At the odour wash setting

9.1.9.2. Odour Clear Mode Operation (Off-Season)

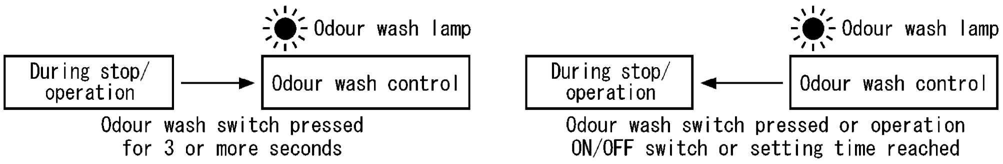
- By conducting heating operations simultaneously in all the rooms for a short period of time, the odour components are removed, the insides of the indoor units are dried out, and the growth of mold is minimized. Odour clear control has two operation modes: odour clear mode (without timer setting) that minimizes the growth of mold, and odour clear mode (with timer setting) which mobilizes a specialized function for removing odour components.

- Odour clear mode

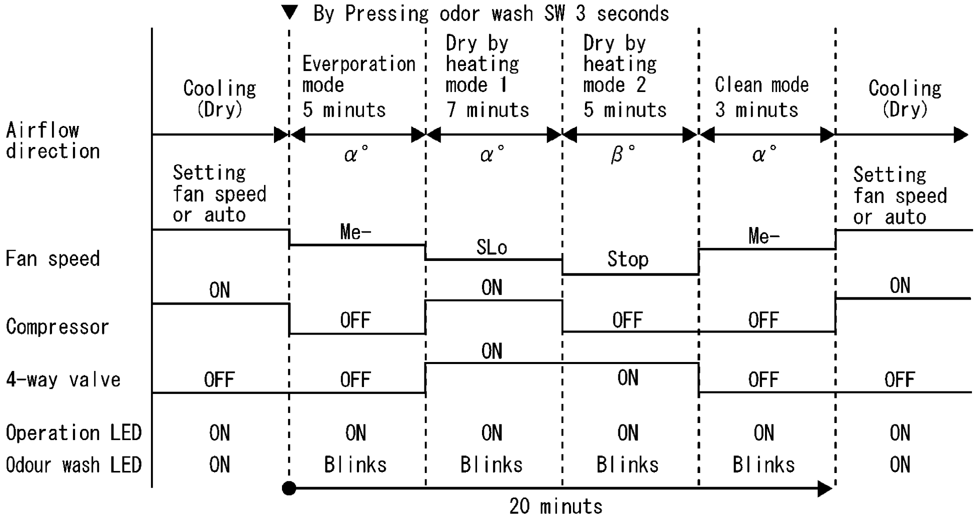

▼Odour wash operation by Remote control
▼Timer setting of Odour crear by Timer
Normal operation or stop
Everporation mode
Dry by heating mode 1
Dry by heating mode 2
Clean mode
Normal operation or stop
Resume the previous operation mode automaticaly after this mode is compleated.

The odour clear mode of all rooms are carried out by setting the odour clear mode of one room.

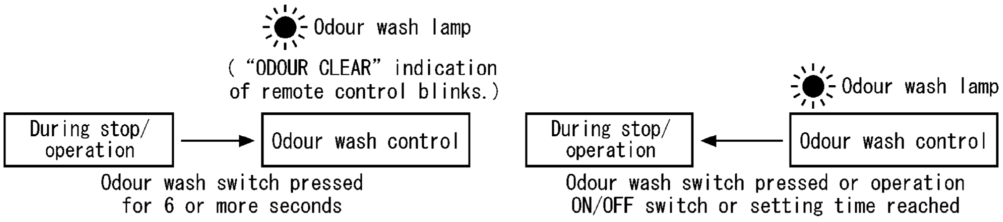
(1) Odour clear mode operation (without timer setting)


Odour wash lamp
During stop/ operation
Odour wash control
Odour wash switch pressed for 3 or more seconds
Odour wash lamp
During stop/ operation
Odour wash control
Odour wash switch pressed or operation ON/OFF switch or setting time reached

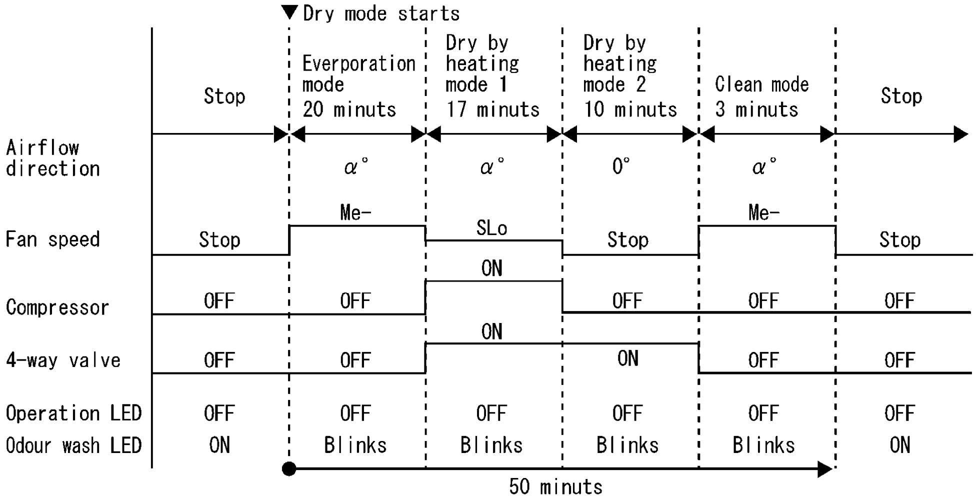
- The POWER lamp lights if the air conditioner is operated before the odour clear operation, and it goes off if air conditioner has been stop.
- Operation is switched to odour removing control 20 minutes after the odour clear operation started.
- Time chart


By Pressing odor wash SW 3 seconds
Cooling (Dry)
Everporation mode 5 minuts
Dry by heating mode 1 7 minuts
Dry by heating mode 2 5 minuts
Clean mode 3 minuts
Cooling (Dry)
Airflow direction
α°
α°
β°
α°
Setting fan speed or auto
Setting fan speed or auto
Fan speed
Me-
SLo
Stop
Me-
Compressor
ON
OFF
ON
OFF
OFF
ON
4-way valve
OFF
OFF
ON
ON
OFF
OFF
Operation LED
ON
ON
ON
ON
ON
ON
Odour wash LED
ON
Blinks
Blinks
Blinks
Blinks
ON
20 minuts

(2) Odour clear mode operation (with timer setting)


Odour wash lamp
("ODOUR CLEAR" indication of remote control blinks.)
During stop/ operation
Odour wash control
Odour wash switch pressed for 6 or more seconds
Odour wash lamp
During stop/ operation
Odour wash control
Odour wash switch pressed or operation ON/OFF switch or setting time reached

- The POWER lamp lights up if the air conditioner is operated before the odour clear operation, and it goes off if air conditioner has been stop.
- Operation is switched to odour removing control 50 minutes after the odour clear operation started.
- Time chart


Dry mode starts
Stop
Everporation mode 20 minuts
Dry by heating mode 1 17 minuts
Dry by heating mode 2 10 minuts
Clean mode 3 minuts
Stop
Airflow direction
α°
α°
0°
α°
Fan speed
Stop
Me-
SLo
Stop
Me-
Stop
Compressor
OFF
OFF
ON
OFF
OFF
OFF
4-way valve
OFF
OFF
ON
ON
OFF
OFF
Operation LED
OFF
OFF
OFF
OFF
OFF
OFF
Odour wash LED
ON
Blinks
Blinks
Blinks
Blinks
ON
50 minuts

9.1.10. Auto Restart Control

- if there is a power failure, operation will automatically be restarted when the power is resumed. It will start with the previous operation mode and airflow direction. (Time Delay Safety Control is valid)

1. Control start conditions

<1> The 24-hour timer must not be set.

<2> The sleep timer must not be set.

Auto restart control is not available when timer or sleep mode is set.

2. Description of control

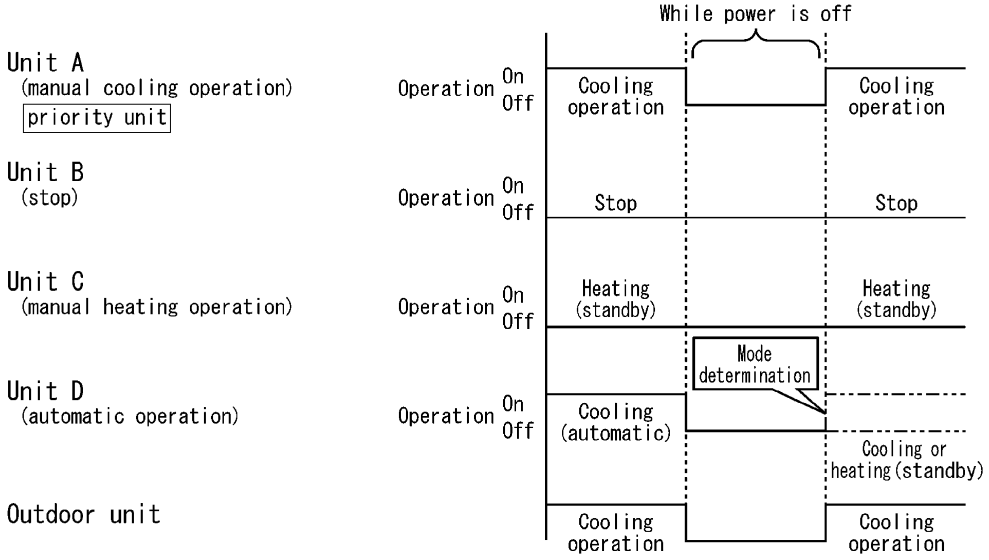
<1> In the case of manual operation, the operation mode, temperature setting, fan speed and airflow direction before the power is turned off are restored.

<2> In the case of automatic operation, after the power is restored operation starts with the determination of the mode.

<3> While the air conditioner odour clear timer has been set, the setting is cancelled, and operation is transferred to the mode before the power is turned off.

<4> While the air conditioner odour clear operation (with timer / without timer setting) are being performed, both of these operations are completed, and operation is transferred to the operation mode prior to these operations.

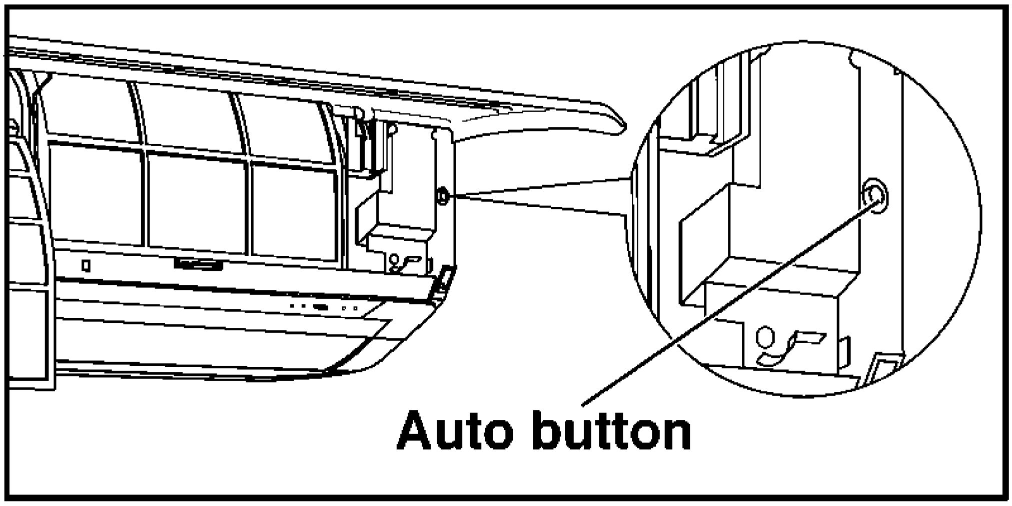
Example: When the power is turned off during an outdoor unit cooling operation


While power is off
Unit A
(manual cooling operation)
priority unit
Unit B
(stop)
Unit C
(manual heating operation)
Unit D
(automatic operation)
Outdoor unit
Operation
On
Off
Cooling operation
Stop
Heating (standby)
Cooling (automatic)
Mode determination
Cooling or heating (standby)
Cooling operation

9.1.11. Other Indoor Unit Operation Functions

- Auto button

Proceed with operation when the air conditioner is stopped. (When the auto button is pressed during operation, the air conditioner is stopped.)


Auto button

1. Emergency operation

   Press the auto button and release it within 5 seconds to perform emergency operation.

   Under normal condition (failure is not occurred) automatic operation is performed. In the event of a failure that still enables operation to be performed, emergency operation is performed.

2. Forced cooling operation

   Press the auto button about 5-8 seconds (1 beep sound) to

**perform the forced cooling operation.
The air conditioner does not operate for 2 minutes if the room temperature is low (intake temperature below 16 °C) so just wait. The forced operation is performed after the 2 minutes have elapsed.**

3. Forced heating operation

Press the auto button about 8-11 seconds (2 beeps sound) to perform the forced heating operation.

4. Setting modes (Remote control transmission code, current switching mode)

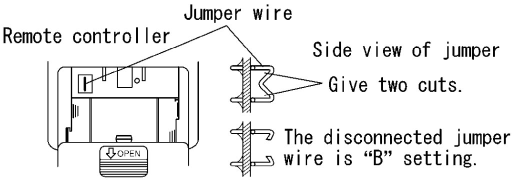
The remote control transmission code selection mode is established by pressing the AUTO button about 11-16 seconds (3 beeps sound). Now remove the remote control unit's battery cover, and short the "Setting" terminals to establish the current switching mode.

Remote control transmission code selection … remote control unit no.A (beep) ⟺ remote control unit no.B (extended beep)
(Auto button operation)

■ CHANGING THE REMOTE CONTROL TRANSMISSION CODE

**- When installing two air conditioners in one room, each air conditioner can be synchronized to the remote control.
In order to operate separately, open the rear cover of one of the remote control and set to “B”.**

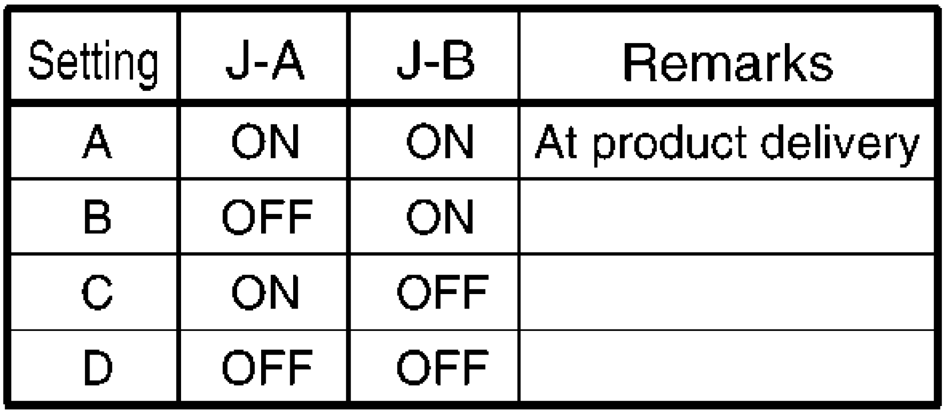
**Set “B” on the remote control.
This can be achieved by cutting the jumper wire of the remote control with a cutter.**



Setting the air conditioner unit to “B”

1. **Press the “AUTO” button for about 11 to 15 seconds. When you hear three short beeps “pep, pep, pep”, release the button.**
   Note: you will hear one beep “pep” in about 5 seconds, and then two beeps “pep, pep” in about 8 seconds.
2. **Press again the “AUTO” button within 60 seconds. Every press the “AUTO” button, you pressing the “AUTO” button, which achieves “B” setting.**
   If you stop pressing the “AUTO” button midway at the short beep “pep”, this will achieve “A” setting.
3. **After 60 seconds or longer of the above setting, use the “B” set remote control to confirm successful operation.**
4. **Set, A, B, C or D transmission code at remote control. (Fig.1)**

Remote Control
Transmission Code Change (Fig.1)



Setting	J-A	J-B	Remarks
A	ON	ON	At product delivery
B	OFF	ON	
C	ON	OFF	
D	OFF	OFF	

ON: Connected
OFF: Disconnected

5. **Press auto button 11 to 15 seconds, of indoor unit.**
6. **Transmit the signal from remote control to indoor unit.**

5. Odour clear setting mode

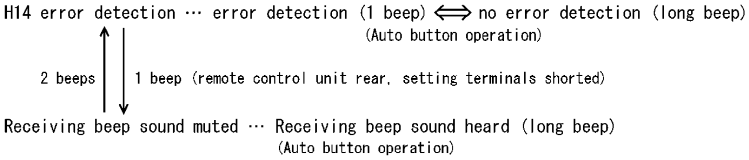
The odour clear inhibit mode is established by pressing the AUTO button 16-21 seconds (4 beeps sound).

Odour clear (beep) ⟺ Odour clear inhibit (long beep sound)
(Auto button operation)

6. Individual setting mode

The H14 error detection selection mode is established by

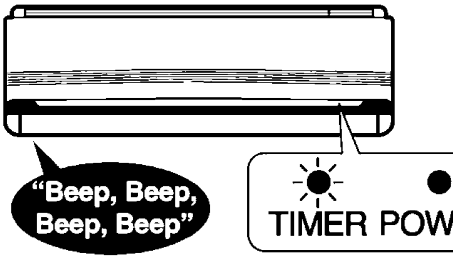
pressing the auto button about for 21 seconds (5 beeps sound). Now remove the remote control unit's battery cover, and short the "SET" terminals to establish the beep sound mute mode.


H14 error detection … error detection (1 beep) ⟺ no error detection (long beep)
(Auto button operation)
2 beeps
1 beep (remote control unit rear, setting terminals shorted)
Receiving beep sound muted … Receiving beep sound heard (long beep)
(Auto button operation)

*** If the auto button is pressed and 26 seconds or so are allowed to elapse, the auto button operation mode is restored. When nothing happens for 60 seconds in the "Setting mode", "Odour clear setting mode" or "individual setting mode" or if a remote control code is received, the mode concerned is canceled.**

9.1.12. Self Diagnosis display

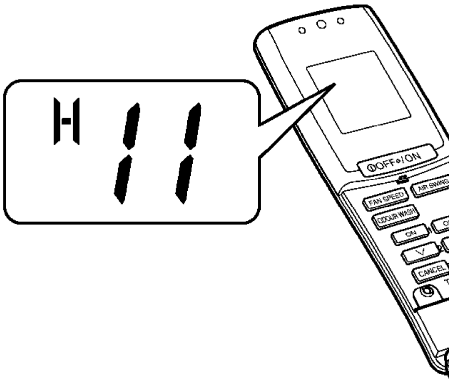
The diagnostic displays that appear when trouble has occurred can be checked using the remote control unit.
When trouble occurs, operation is stopped automatically, and the timer lamp blinks. The diagnosis time has been reduced by warning the user by means of the blinking of the timer lamp.



- When trouble occurs, operation is stopped automatically, and the timer lamp blinks.

- The timer lamp will go off if the power is turned off, but it will start blinking again if the air conditioner is operated with the trouble left unremedied.

- No diagnostic displays will appear when the unit is operated after the trouble has been remedied. However, the last diagnostic symbol is stored in the IC's memory. (This symbol can be cleared.)



- When the air conditioner protection operation is triggered because the air conditioner is being operated under overload conditions, its heat radiation is being interfered with or anti-freezing operation is initiated or because its supply voltage has dropped or its power has been turned off and then back on during operation, for instance, no diagnostic displays will appear. However, F99 and other such information are stored in the IC's memory: this is normal and not indicative of malfunctioning.

- The diagnostic displays appear automatically when trouble occurs.
  1. Operation is stopped automatically.
  2. The timer lamp of the display unit on the right side of the indoor unit blinks.
  3. The timer lamp goes off when the power is turned off.
- To display the trouble (or protection operation) status stored in the memory
  1. Turn on the power.
  2. Open the remote control unit's door, and press the timer setting "UP-ARROW" button for 5 seconds.
  3. Press the "UP-ARROW" button slowly and repeatedly until 4 beeps are heard continuously from the indoor unit.
  4. The 3-digit alphanumeric display on the remote control unit indicates the trouble which has occurred.

  * If the 3-digit alphanumeric display on the remote control unit and the nature of the trouble match, the operation lamp (green) will light.
- To clear the trouble (or protection operation) status stored in the memory after remedial action has been taken
  1. The air conditioner is reset by turning its power off and back on.

  * If it is not reset by turning its power off and back on, remove the battery cover from the remote control unit. The air conditioner can then be forcibly reset by shorting the "RESET" terminals toward the main unit (one receiving beep).

- Concerning emergency operation (which can be performed in some of the trouble conditions)
  1. Using the remote control unit, select COOL or HEAT, and press the operation OFF/ON button. (4 receiving beeps are heard, and the timer lamp blinks.)
  2. The air conditioner can now be used temporarily until its trouble is remedied.

Characters allowing temporary operation	Possible temporary operations	Des of op
H23	Cooling	Eme opera limited (The T continue
H27 H28	Heating Cooling	

9.1.12.1. Error Cord

Diagnostic Display	Abnormality or Protection control Works
H 11	Indoor/Outdoor abnormal communication
H 12	Indoor unit capacity unmatched
H 14	Intake air temp.sensor
H 16	Outdoor Current Transformer
H 19	Indoor fan motor mechanism lock
H 23	Indoor heat exchanger temp.sensor
H 27	Outdoor air temp.sensor
H 28	Outdoor heat exchanger temp.sensor 1
H 30	Outdoor discharge pipe temp.sensor
H 32	Outdoor heat exchanger temp.sensor 2
H 34	Outdoor heat sink temp.sensor
H 36	Abnormal gas pipe temp.sensor
H 37	Outdoor liquid pipe temp.sensor
H 39	Abnormal indoor operating unit or standby units
H 41	Abnormal wiring or piping connection
H 97	Outdoor fan motor mechanism lock
H 98	Indoor high pressure protection
H 99	Indoor operating unit freezing
F 11	4-way valve switching failure
F 17	Indoor standby units freezing
F 90	PFC circuit protection
F 91	Refrigeration cycle abnormality
F 93	Compressor abnormal revolution
F 95	Outdoor high pressure protection
F 96	Power transistor module or compressor overheating
F 97	Compressor high discharge temperature
F 98	Total running current protection
F 99	DC peak detection

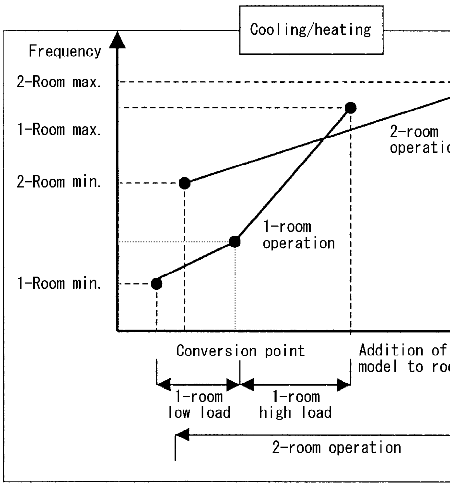
9.2. OUTDOOR UNIT OPERATION (CU-2E15CBPG/2E18CBPG)

9.2.1. Compressor Operation Frequent

9.2.1.1. Cooling, Dry and Heating Operations

-The compressor operation frequency is determined by room temperature, capacity rank algebra and model code algebra.

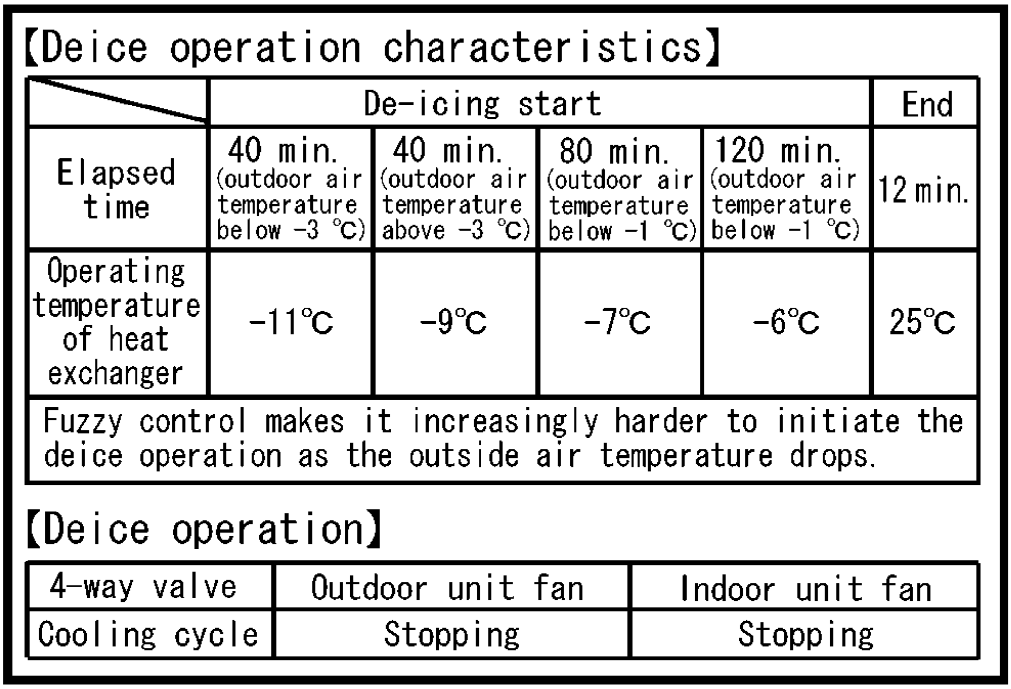
1. When operation is started after the air conditioner has been stopped for more than one hour, the air conditioner operates at a high frequency which lowers the room temperature quickly for cooling (or raises it quickly for heating) .
2. If, when two or more indoor units are operating, the thermostat is set to OFF in one room, the automatic expansion valve is closed to adjust the flow of refrigerant so as to control the room temperature.
3. When the thermostat is set to OFF during 1-room operation, the compressor and fan of the outdoor unit are stopped. (The outdoor unit fan is stopped 30 seconds after the compressor.)
4. It takes about 180 seconds to restart operation when the compressor has been stopped. (Time delay safety control)



9.2.2. Deice Operation (Fuzzy Control) <Heating>

- The extent of the frost is estimated from the operating time, temperature of the outdoor heat exchanger and outside air temperature.
- Highly efficient deice operation coped with to the frost condition is performed.

1. When the temperature of the outdoor unit heat exchanger falls below 3 °C, the de-icing timer is activated. When it comes below the operation temperature continuously for 3 minutes after the timer setting has been reached, the deice operation is started.
2. The 4-way valve is switched, and the frost is thawed out in the cooling cycle.
3. De-icing ends about 12 minutes after it started or when the temperature of the heat exchanger rises above 25 °C.



【Deice operation characteristics】

	De-icing start				End
Elapsed time	40 min. (outdoor air temperature below -3 ℃)	40 min. (outdoor air temperature above -3 ℃)	80 min. (outdoor air temperature below -1 ℃)	120 min. (outdoor air temperature below -1 ℃)	12 min.
Operating temperature of heat exchanger	-11℃	-9℃	-7℃	-6℃	25℃

Fuzzy control makes it increasingly harder to initiate the deice operation as the outside air temperature drops.

【Deice operation】

4-way valve	Outdoor unit fan	Indoor unit fan
Cooling cycle	Stopping	Stopping

9.2.3. Protection Control

9.2.3.1. Time Delay Safety Control

- The compressor does not restart for 3 minutes after stop of compressor.

9.2.3.2. Total Running Current Control

1. **When the air conditioner has been operated at the capacity designated by the indoor unit and the total running current exceeds setting I1, the operating frequency of the compressor is reduced. Conversely, when the total current drops below setting I1, it is increased (but only up to the capacity designated by the indoor unit).**
2. **The compressor is stopped as soon as the total current exceeds setting I2.**
3. **If the compressor is stop by the total running current control on 3 occasions in a 20-minute period, the "F98" error is displayed.**

	Setting	CU-2E15CBPG/2E18CBPG
Dry-Cooling	I1	9.0A
	I2	15.0A
Heating	I1	12.5A
	I2	17.0A

9.2.3.3. IPM Protection Control (DC Peak)

9.2.3.3.1. D.C. Peak

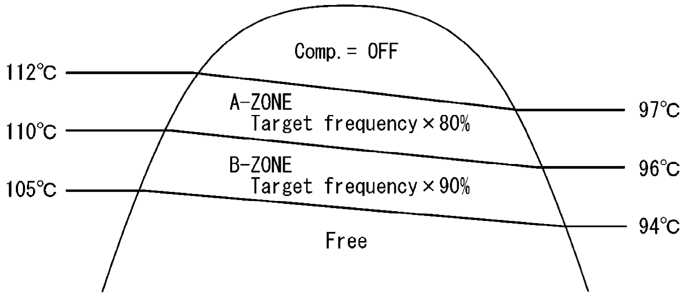
- **When the inverter load current (DC peak current) exceeds the setting value (22.5A), the compressor is stopped immediately. If this happens within 30 seconds after it started operating, it will restart one minute later; if it happens after 30 seconds have elapsed since it started operating, it will restart 3 minute later.**
- **If the DC peak current exceeds the setting value on 7 consecutive occasions within 30 seconds after the compressor started operating, the "F99" error is displayed, and the unit operation is stopped.**

9.2.3.3.2. IPM Overheating Prevention Control

- **The compressor is stopped when the overheating protection circuit inside the IPM has been activated. It restarts after 3 minutes. Activation temperature: 110 °C Reset temperature: 95 °C**

9.2.3.4. Compressor Overheat Protection Control

1. **When the compressor discharge temperature exceeds 105 °C, compressor frequency control (including expansion valve control) is conducted.**



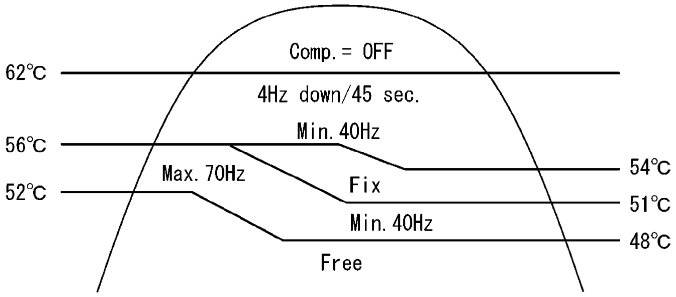
- **If the compressor stopping in response to that the temperature of the compressor discharge temperature exceeds 112 °C on 3 occasions during a 30-minute period, timer LED blinks. (F97: compressor overheat)**

9.2.3.5. Over Load Protection Control (Cooling . Dry Mode)

- **Cooling over load protection control**

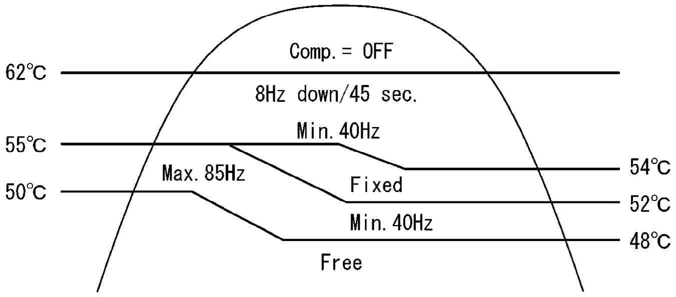
1. **When the temperature of the outdoor unit heat exchanger exceeds 52 °C during a cooling or dehumidifying operation, the compressor frequency is restricted, and when it exceeds 62 °C, the compressor is stopped. (Time delay safety control is conducted.)**
2. **If the compressor stooping in response to this control on 4**

occasions during a 20-minute period, the indoor timer lamp blinks. (F95: outdoor high pressure protection)


Comp. = OFF
62°C
4Hz down/45 sec.
Min. 40Hz
56°C
54°C
Max. 70Hz
Fix
52°C
51°C
Min. 40Hz
48°C
Free

- Heating over load protection control

1. When the temperature of the indoor unit heat exchanger exceeds 50 °C during a heating operation, the compressor frequency is restricted; furthermore, when it exceeds 62 °C, the compressor is stopped, and time delay safety control is then conducted. (H98)


Comp. = OFF
62°C
8Hz down/45 sec.
Min. 40Hz
55°C
54°C
Max. 85Hz
Fixed
50°C
52°C
Min. 40Hz
48°C
Free

9.2.3.6. Low Pressure Control (Gas Leakage Protection)

- When the following conditions as shown in the below table occur for 5 minutes, the compressor stops and restarts after 3 minutes. If this phenomenon is continuously occurring twice within 20 minutes, the air conditioner will stop operation and the Timer LED blinks. (F91: Refrigeration cycle abnormality.)

Comp. Frequency	CU-2E15CBPG	63Hz or above	78Hz or above
	CU-2E18CBPG	62Hz or above	82Hz or above
Total Running Current		1.5A≦I<1.88A	1.5A≦I<1.88A
Indoor Heat Exchanger Temp.		20°C or above	25°C or below
Operation		Cooling/Dry	Heating

Note:

The above conditions are not valid during Deice operation.

● this conditions are continuous for 5 minutes.

9.2.3.7. 4-way Valve Failure Protection Control (Cooling/Heating Switching Errors)

- During a cooling operation

1. If the temperature of the indoor unit heat exchanger exceeds 45 °C 4 minutes after the compressor started, the compressor is stop. (It restarts 3 minutes later → Time delay safety control.)

2. If this happens on 4 occasions in a 30-minute period, timer lamp blinks. ("F11" error)

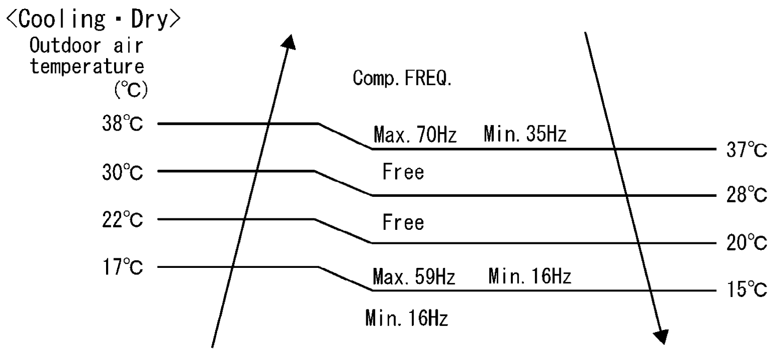
- During a heating operation

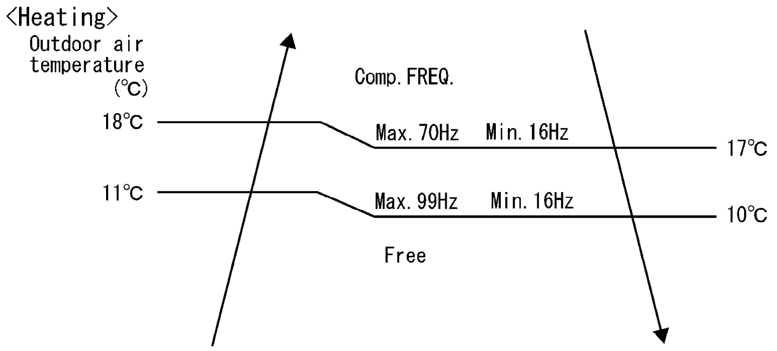
1. If the temperature of the indoor unit heat exchanger drops below 5 °C 4 minutes after the compressor started, the compressor is stopped. (It restarts 3 minutes later → Time delay safety control.)

2. If this happens on 4 occasions in a 30-minute period, timer lamp blinks. ("F11" error)

9.2.3.8. Outdoor Air Temperature Control

- The compressor operating frequency is regulated in accordance to the outdoor air temperature.


<Cooling・Dry>
Outdoor air temperature (°C)
Comp. FREQ.
38°C
30°C
22°C
17°C
Max. 70Hz Min. 35Hz
Free
Free
Max. 59Hz Min. 16Hz
Min. 16Hz
37°C
28°C
20°C
15°C


<Heating>
Outdoor air temperature (°C)
Comp. FREQ.
18°C
11°C
Max. 70Hz Min. 16Hz
Max. 99Hz Min. 16Hz
Free
17°C
10°C

- This control is not applicable during minimum frequency operation protection control, deice operation, pump down operation.

9.2.4. Abnormal Wiring or Piping Connection Checking Control

1. Objective

To check for Abnormal Wiring or Piping connections during a cooling operation after the air conditioner has been installed.

2. Detection subjects

Heat exchanger temperature of indoor unit which is not operating, and outdoor unit gas pipe temperature

3. Condition of control

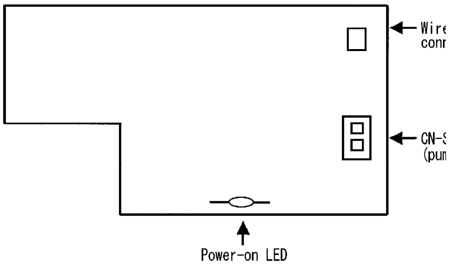
- **The compressor is turned ON by the forced cooling operation after the power was turned on**
- **After compressor started 3 minutes, the gas pipe temperature of the non-operated indoor unit dropped by more than 5 °C**
- **The outdoor air temperature is more than 5 °C**
- **A non-operated unit is present**

When above conditions are satisfied all, the timer lamp blinks. (H41 error)

9.2.5. Pump Down Control (Forced Cooling Operation)

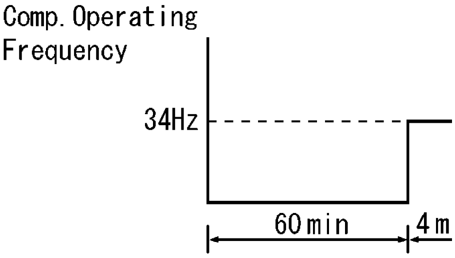
-By shorting the "CN-S" terminals on the outdoor unit P.C. Board, the air conditioner can be made to operate in the cooling mode regardless of what is designated by the indoor unit.

*** If the shorting of the terminals is released, the compressor is stopped immediately. Three minutes later, it is operated according to designation of indoor unit.**



Minimum frequency operation protection

- When the compressor operates at less than 30Hz for 60 minutes, the operating frequency will increase to 35Hz for 4 minutes.



9.3. OUTDOOR UNIT OPERATION (CU-3E23CBPG/CU-4E27CBPG)

9.3.1. Room Temperature Control

9.3.1.1. Cooling, Dry and Heating Operations

Concerning CU-3E23CBPG and CU-4E27CBPG compressor frequency control

1. **Immediately after the compressor has started up during an ongoing operation, the initial frequency is determined on the basis of the information obtained from the heat exchanger capacities of the indoor units (thermostat ON) and the airflows set by their remote controls.**
2. **During an ongoing operation, the difference between the temperature set in each of the rooms and the room temperature is detected, the total load is calculated, and the compressor frequency is determined on the basis of this information.**
3. **When one room turns the thermostat OFF while two or more indoor units are operating, the automatic expansion valve closes to restrict the flow of refrigerant, the compressor control is temporarily suspended, and both the initial frequency and total load are determined again.**
4. **When the thermostat is turned OFF during 1-room operation, the outdoor unit's compressor and fan stop. (The outdoor unit's fan stops 60 seconds after the compressor.)**
5. **It takes about 180 seconds for the compressor to be restarted after it has stopped. (Re-start control)**

9.3.2. Deice Operation Control <Heating>

1. **When the temperature of the heat exchanger drops below the deice operation start temperature during a heating operation, deice operation is started, and when it rises above the release temperature, deice operation is released.**
2. **To prevent needless deicing or excessively long deicing, the deice operation start temperature is changed each time in such a way that deicing is completed in the specified time.**
    - **Specified time: 4 to 7 minutes**
    - **When the time required for deicing is longer than the specified time, the deice operation start temperature is raised by 1 °C.**
    - **When the time required for deicing is shorter than the specified time, the deice operation start temperature is**

lowered by 1 °C.

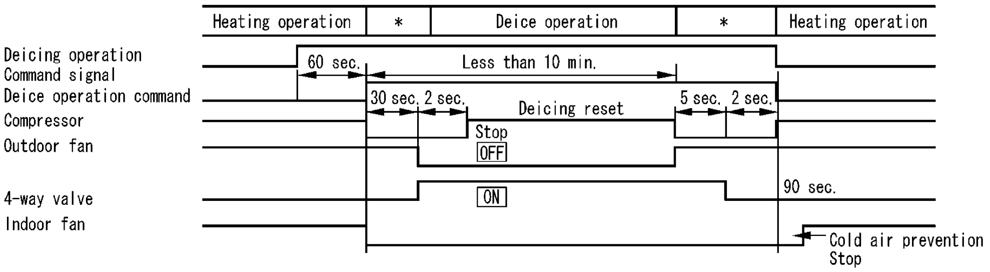
- The start temperature is changed in the range of -3 to -15.5 °C.

3. Deice operation is not performed during the guarded periods given below.

   - For a cumulative total of 35 minutes after operation started and after deicing was completed
   - For 5 minutes after the compressor started

4. In order to reduce the noise of the 4-way valve switching, the switching is done after the compressor has been stopped temporary.
5. The deicing time is at most 10 minutes.

Time chart

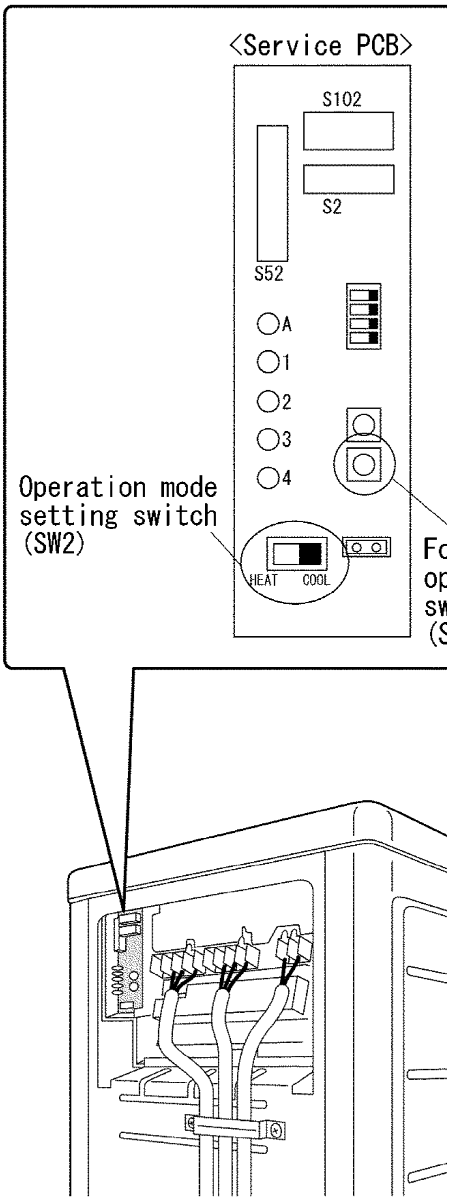

Heating operation
*
Deice operation
*
Heating operation
Deicing operation Command signal
Deice operation command
Compressor
Outdoor fan
4-way valve
Indoor fan
60 sec.
Less than 10 min.
30 sec.
2 sec.
Deicing reset
5 sec.
2 sec.
Stop
OFF
ON
90 sec.
Cold air prevention
Stop

Note: "*" indicates the buffer time for dealing with the 4-way valve switcing noise.

9.3.3. Forced Cooling Operation Control

- Forced cooling operations can be performed by the outdoor unit.

1. Set the operation mode setting switch (SW2) to COOL.
2. The forced cooling operation is performed when the forced operation switch (SW1) is pressed.
*** The forced cooling operation stops when the forced operation switch (SW1) is pressed again.**



9.3.4. Wiring Error Check Control

The useful wiring error check function automatically corrects wiring errors using a microcomputer.
In cases where wires are embedded or the locations of connecting wires are not known for other reasons, for instance, pressing the wiring error check switch inside the right side panel of the outdoor unit enables operation as is even if the wires to room A are connected to room B by mistake. Wiring error checks cannot be performed in the following situations:

- **For about 30 seconds (during the initial settings) after the power was turned on**
- **During the 3-minute standby after the compressor has stopped**
- **When the outside air temperature is below 5 °C**

- When trouble has occurred in the indoor unit (including trouble in transmission to all rooms)
  This function need not be used if the correct piping and wiring are completely done.

■ Operation method

1. Remove the service panel (right side panel). (5 screws)
2. Press the writing error check switch on the service monitor P.C. Board to start the writing error check operation.
3. The writing error check is automatically completed in about 10 to 15 minutes.
4. When the faulty wiring check is completed, the service monitor LEDs blink.

LED	1	2	3	4	Judgement
Display	All LEDs blink			Blinking	Automatic Correction cannot be done.
	Blink in sequence			Off	Automatic Correction have been implemented.

Automatic correction have been implemented: LEDs 1, 2 and 3 blink in sequence (LED4 is off).
Automatic correction cannot be done: LEDs 1 to 4 blink simultaneously to indicate:

- A transmission problem in one of the indoor units
- A disconnected heat exchanger thermistor in an indoor unit
- Trouble in an indoor unit (when the trouble has occurred during the wiring error check)

Trouble stopping: One of the LEDs 1 to 4 lights.

Precautions

1. About 10 to 15 minutes are required to conduct the check after the wiring error switch is pressed.
   (Only wiring error between an unit A and unit B cannot be corrected.)
2. If liquid pipes and gas pipe connected to different unit it cannot be corrected "automatically", be absolutely sure to run the liquid pipes and gas pipes in pairs.
3. If the wiring error check switch is pressed again during a wiring

error check, the wiring error check can be forcibly terminated. In this case, what is stored in the microcomputer will be the initial statuses (wiring room A → piping A port, wiring room B → piping B port).

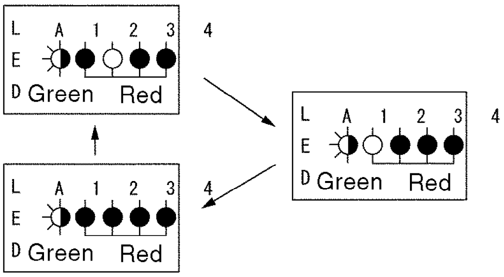
4. **The wiring error check function MUST be used when the outdoor unit P.C. Board is replaced.**

Basic knowledge

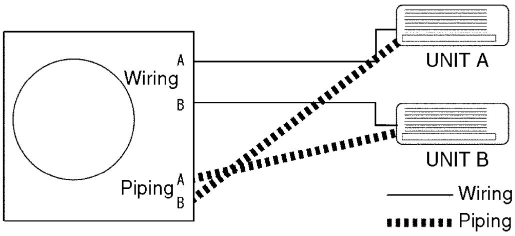
- **The principle operation of this function is as follows: The refrigerant flows in succession from the port A, and by detecting the temperature of the indoor unit heat exchanger sensor, the connected pipes and wires are collated.**
- **The sound of ice forming (a crackling noise) may be heard from the indoor unit while this function is operating: this is normal and not indicative of a malfunction. (This phenomenon occurs because the heat exchanger temperature is lowered to 0 °C or below in order to improve the detection accuracy.)**
- **The indoor fan is also set to ON and OFF at the same time.**

■ How to check the information currently stored in the microcomputer

This information can be checked by observing the blinking of the LEDs on the service monitor upon completion of the wiring error check, during forced operation or after stopped.
LED1: Wiring room A, LED2: wiring room B
The first LED to blink denotes the piping port A and the second LED denotes the piping port B. The LED which has lighted first denotes the room whose wiring is connected to the piping port A, and the next LED denotes the port B.
<Example> When the LEDs blink as shown below



The LEDs in this figure denote that the piping port A has been connected (automatically corrected) to the wiring room B and that the piping port B has been connected (automatically corrected) to the wiring room A.



10. Installation and Servicing Air Conditioner Using R410A (General Information)

10.1. OUTLINE

10.1.1. About R410A Refrigerant

1. **Converting air conditioners to R410A / Since it was declared in1974 that chlorofluorocarbons (CFC), hydro chlorofluorocarbons (HCFC) and other substances pose a destructive danger to the ozone layer in the earth~s upper stratosphere (20 to 40 km above the earth), measures have been taken around the world to prevent this destruction. / The R22 refrigerant which has conventionally been used in ACs is an HCFC refrigerant and, therefore, possesses this ozone-destroying potential. International regulations (the Montreal Protocol Ozone-Damaging Substances) and the domestic laws of various countries call for the early substitution of R22 by a refrigerant which will not harm the ozone layer.**

   - **In ACs, the HFC refrigerant which has become the mainstream alternative called R410A.Compared with R22, the pressure of R410A is approximately 1.6 times as high at the same refrigerant temperature, but the energy efficiency is about the same. Consisting of hydrogen (H), fluorine (F) and carbon (C), R410A is an HFC refrigerant. Another typical HFC refrigerant is R407C. While the energy efficiency of R407C is some what inferior to that of R410A, it offers the advantage of having pressure characteristics which are about the same as those of R22, and is used mainly in packaged ACs.**

2. **The characteristics of HFC (R410A) refrigerants**
   A. **Chemical characteristics / The chemical characteristics of**

R410A are similar to those of R22 in that both are chemically stable, non-flammable refrigerants with low toxicity. / However, just like R22, the specific gravity of R410A gas is heavier than that of air. Because of this, it can cause an oxygen deficiency if it leaks into a closed room since it collects in the lower area of the room. It also generates toxic gas when it is directly exposed to a flame, so it must be used in a well ventilated environment where it will not collect.

Table 1 Physical comparison of R410A and R22

	R410A	R22
Composition (wt%)	R32/R125 (50/50)	R22 (100)
Boiling point (°C)	-51.4	-40.8
Vaporizing pressure (25°C)	1.56 Mpa (15.9 kgf/cm^2)	0.94 Mpa (9.6 kgf/cm^2)
Saturated vapor density	64.0 kg/m^3	44.4 kg/m^3
Flammability	Non-flammable	Non-flammable
Ozone-destroying point (ODP)	0	0.005
Global-warming point (GWP)	1730	1700

B. Compositional change (pseudo-azeotropic characteristics) / R410A is a pseudo-azeotropic mixture comprising the two components R32 and R125. Multi-component refrigerants with these chemical characteristics exhibit little compositional change even from phase changes due to vaporization 9or condensation), which means that there is little change in the circulating refrigerant composition even when the refrigerant leaks from the gaseous section of the piping. / Accordingly, R410A can be handled in almost the same manner as the single-component refrigerant R22. However, when charging, because there is a slight change in composition between the gas phase and the liquid phase inside a cylinder or other container, charging should basically begin with the liquid side.

C. Pressure characteristics / As seen in Table 2, the gas pressure of R410A is approximately 1.6 times as high as that of R22 at the same refrigerant temperature, which means that special R410A tools and materials with high-pressure specifications must be used for all refrigerant piping work and servicing.

Table 2 Comparison of R410A and R22 saturated vapor density / Unit: MPa

Refrigerant Temperature (°C)	R410A	R22
-20	0.30	0.14
0	0.70	0.40
20	1.35	0.81
40	2.32	1.43
60	3.73	2.33
65	4.15	2.60

D. R410A refrigerating machine oil / Conventionally, mineral oil or a synthetic oil such as alkylbenzene has been used for R22 refrigerating machine oil. Because of the poor compatibility between R410A and conventional oils like mineral oil, however, there is a tendency for the refrigerating machine oil to collect in the refrigerating cycle. For this reason, polyester and other synthetic oils which have a high compatibility with R410A are used as refrigerating machine oil. / Because of the high hygroscopic property of synthetic oil, more care must be taken in its handling than was necessary with conventional refrigerating machine oils. Also, these synthetic oils will degrade if mixed with mineral oil or alkylbenzene, causing clogging in capillary tubes or compressor malfunction. Do not mix them under any circumstances.

10.1.2. Safety Measure When Installing / Receiving Refrigerant Piping

Cause the gas pressure of R410A is approximately 1.6 times as high as that of R22, a mistake in installation or servicing could result in a major accident. It is essential that you use R410a tools and materials, and that you observe the following precautions to ensure safety.

1. **Do not use any refrigerant other than R410A in ACs that have been used with R410A.**
2. **If any refrigerant gas leaks while you are working, ventilate the room. Toxic gas may be generated if refrigerant gas is exposed to a direct flame.**
3. **When installing or transferring an AC, do not allow any air or substance other than R410A to mix into the refrigeration cycle. If it does, the pressure in the refrigeration cycle can become abnormally high, possibly causing an explosion and/or injury.**
4. **After finishing the installation, check to make sure there is no refrigerant gas leaking.**

5. **When installing or transferring an AC, follow the instructions in the installation instructions carefully. Incorrect installation can result in an abnormal refrigeration cycle or water leakage, electric shock, fire, etc.**
6. **Do not perform any alterations on the AC unit under any circumstances. Have all repair work done by a specialist. Incorrect repairs can result in an water leakage, electric shock, fire, etc.**

10.2. TOOL FOR INSTALLING / SERVICING REFRIGERANT PIPING

10.2.1. Necessary Tools

In order to prevent an R410A AC from mistakenly being charged with any other refrigerant, the diameter of the 3-way valve service port on the outdoor unit has been changed. Also, to increase its ability to withstand pressure, the opposing dimensions have been changed for the refrigerant pipe flaring size and flare nut. Accordingly, when installing or servicing refrigerant piping, you must have both the R410A and ordinary tools listed below.

Table 3 Tools for installation, transferring or replacement

Type of work	Ordinary tools	R410A tools
Flaring	Flaring tool (clutch type), pipe cutter, reamer	Copper pipe gauge for clearance Adjustment, flaring tool (clutch type)*1)
Bending, connecting pipes	Torque wrench (nominal diameter 1/4, 3/8,1/2) Fixed spanner (opposing sides 12 mm, 17 mm, 19 mm) Adjustable wrench, Spring bender	
Air purging	Vacuum pump Hexagonal wrench (opposing sides 4 mm)	Manifold gauge, charging hose, vacuum pump adaptor
Gas leak inspection	Gas leak inspection fluid or soapy water	Electric gas leak detector for HFC refrigerant*2)

***1) You can use the conventional (R22) flaring tool. If you need to buy a new tool, buy the R410A type.**
***2) Use when it is necessary to detect small gas leaks.**
For other installation work, you should have the usual tools, such as screwdrivers (+,-), a metal-cutting saw, an electrical drill, a hole core drill (65 or 70 dia.), a tape measure, a level, a thermometer, a clamp meter, an insulation tester, a voltmeter, etc.

Table 4 Tools for serving

Type of work	Ordinary tools	R410A tools
Refrigerant charging		**Electronic scale for refrigerant charging Refrigerant cylinder Charging orifice and packing for refrigerant cylinder**
Brazing (Replacing refrigerating cycle part*1)	**Nitrogen blow set (be sure to use nitrogen blowing for all brazing), and brazing), and brazing machine**	

***1) Always replace the dryer of the outdoor unit at the same time. The replacement dryer is wrapped in a vacuum pack. Replace it last among the refrigerating cycle parts. Start brazing as soon as you have opened the vacuum pack, and begin the vacuuming operation within 2 hours.**

10.2.2. R410A Tools

1. **Cooper tube gauge for clearance adjustment / (used when flaring with the conventional flaring tool (clutch type))**
   - **This gauge makes it easy to set the clearance for the copper tube to 1.0-1.5 mm from the clamp bar of the flaring tool.**
2. **Flaring tool (clutch type)**
   - **In the R410A flaring tool, the receiving hole for the clamp bar is enlarged so the clearance from the clamp bar can be set to 0 -0.5 mm, and the spring inside the tool is strengthened to increase the strength of the pipe-expanding torque. This flaring tools can also be used with R22 piping, so we recommend that you select it if you are buying a new flaring tool.**
3. **Torque wrenches**

Fig. 1 Copper tube gauge for clearance adjustment

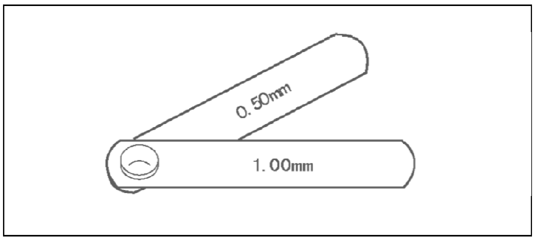


Fig. 2 Flaring tool (clutch type)

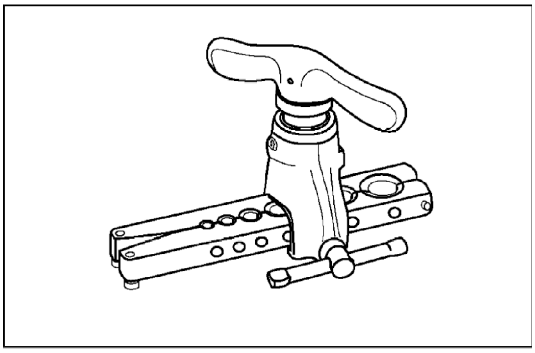


Fig. 3 Torque wrenches

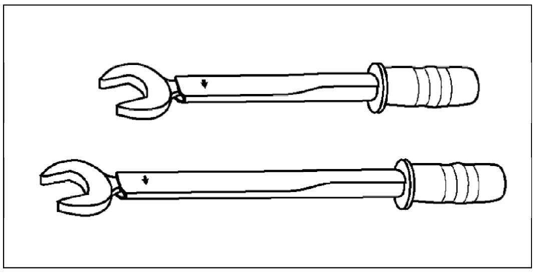


Table 5

	Conventional wrenches	R410A wrenches
For 1/4 (opposite side x torque)	17 mm x 18 N.m (180 kgf.cm)	17 mm x 18 N.m (180 kgf.cm)
For 3/3 (opposite side x torque)	22 mm x 42 N.m (180 kgf.cm)	22 mm x 42 N.m (180 kgf.cm)
For 1/2 (opposite side x torque)	24 mm x 55 N.m (180 kgf.cm)	26 mm x 55 N.m (180 kgf.cm)

4. Manifold gauge

- Because the pressure is higher for the R410A type, the conventional type cannot be used.

Table 6 Difference between R410A and conventional high / low-pressure gauges

	Conventional wrenches	R410A wrenches
High-pressure gauge (red)	-76 cmHg - 35 kgf/cm3	-0.1 - 5.3 Mpa -76 cmHg - 53 kgf/cm3
High-pressure gauge (blue)	-76 cmHg - 17 kgf/cm3	-0.1 - 3.8 Mpa -76 cmHg - 38 kgf/cm3

- The shape of the manifold ports has been changed to prevent the possibility of mistakenly charging with another type of refrigerant.

Table 7 Difference between R410A and conventional manifold port size

	Conventional gauges	R410A gauges
Port size	7/6 UNF 20 threads	1/2 UNF 20 threads

5. Charging hose

- The pressure resistance of the charging hose has been raised to match the higher pressure of R410A. The hose material has also been changed to suit HFC use, and the size of the fitting has been changed to match the manifold ports.

Fig. 4 Manifold gauge charging hose

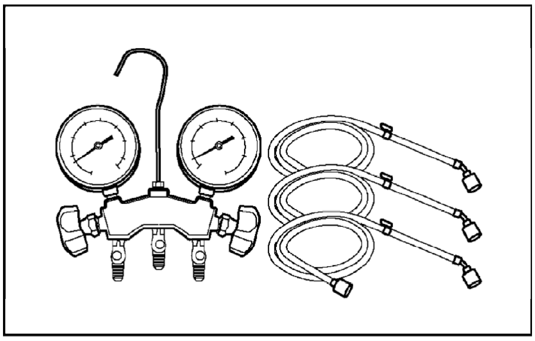


Table 8 Difference between R410A and conventional charging hoses

		Conventional hoses	R410A hoses
Pressure resistance	Working pressure	3.4 MPa (35 kgf/cm3)	5.1 MPa (52 kgf/cm3)
	Bursting pressure	17.2 MPa (175 kgf/cm3)	27.4 MPa (280 kgf/cm3)
Material		NBR rubber	HNBR rubber Nylon coating inside

6. Vacuum pump adaptor

- When using a vacuum pump for R410A, it is necessary to install an electromagnetic valve to prevent the vacuum pump oil from flowing back into the charging hose. The vacuum pump adaptor is installed for that purpose. if the vacuum pump oil (mineral oil) becomes mixed with R410A, it will damage the unit.

7. Electric gas leak detector for HFC refrigerant

- The leak detector and halide torch that were used with CFC and HCFC cannot be used with R410A (because there is no chlorine in the refrigerant).
- The present R134a leak detector can be used, but the detection sensitivity will be lower (setting the sensitivity for R134a at 1, the level for R410A will drop to 0.6).

- For detecting small amounts of gas leakage, use the electric gas leak detector for HFC refrigerant. (Detection sensitivity with R410A is about 23 g/year).

Fig. 5 Vacuum pump adaptor

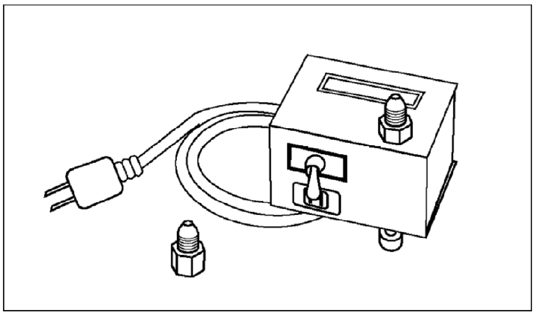
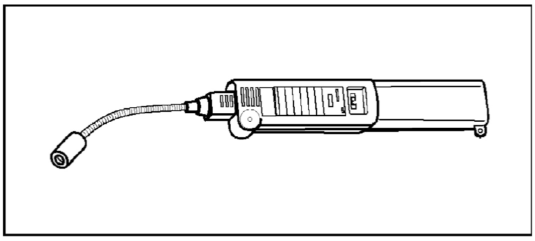


Fig. 6 Electric gas leak detector for HFC refrigerant



8. Electronic scale for refrigerant charging

- Because of the high pressure and fast vaporizing speed of R410A, the refrigerant cannot be held in a liquid phase inside the charging cylinder when charging is done using the charging cylinder method, causing bubbles to form in the measurement scale glass and making it difficult to see the reading. (Naturally, the conventional R22 charging cylinder cannot be used because of the differences in the pressure resistance, scale gradation, connecting port size, etc.)
- The electronic scale has been strengthened by using a structure in which the weight detector for the refrigerant cylinder is held by four supports. It is also equipped with two connection ports, one for R22 *7/16 UNF, 20 threads) and one for R410A (1/2 UNF, 20 threads), so it can also be used for conventional refrigerant charging.
- There are two types of electronic scales, one for 10-kg cylinders and one for 20-kg cylinders. (The 10-kg cylinder is recommended.)

  Refrigerant charging is done manually by opening and closing the valve.

9. Refrigerant cylinders

- The R410A cylinders are labeled with the refrigerant name, and the coating color of the cylinder protector is pink, which is the color stipulated by ARI of the U.S.
- Cylinder equipped with a siphon tube are available to allow the cylinder to stand upright for liquid refrigerant charging.

10. Charging orifice and packing for refrigerant cylinders

- The charging orifice must match the size of the charging hose fitting (1/2 UNF, 20 threads).
- The packing must also be made of an HFC-resistant material.

Fig. 7 Electronic scale for refrigerant charging

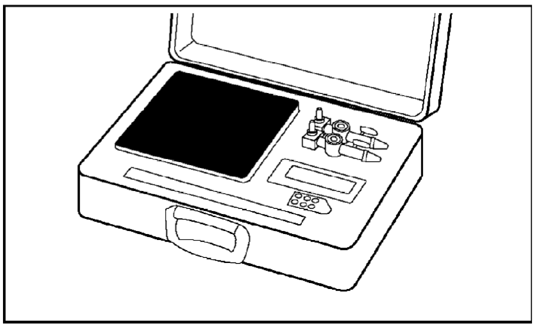


Fig. 8 Refrigerant cylinders

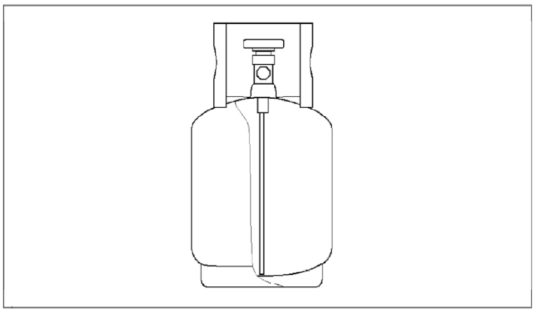
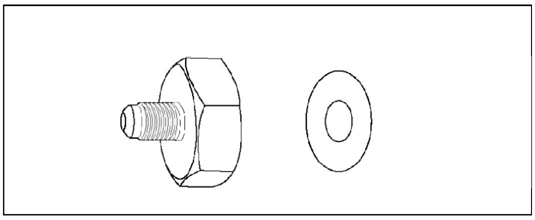


Fig. 9 Charging orifice and packing



10.2.3. R410A Tools Which are Usable for R22 Models

Table 9 R410A tools which are usable for R22 models

	R410A tools	Usable for R22 models
(1)	Copper tube gauge for clearance adjustment	OK
(2)	Flaring tool (clutch type)	OK
(3)	Manifold gauge	NG
(4)	Charging hose	NG
(5)	Vacuum pump adaptor	OK
(6)	Electric gas leak detector for HFC refrigerant	NG
(7)	Electronic scale for refrigerant charging	OK
(8)	Refrigerant cylinder	NG
(9)	Charging orifice and packing for refrigerant cylinder	NG

10.3. REFRIGERANT PIPING WORK

10.3.1. Piping Materials

It is recommended that you use copper and copper alloy jointless pipes with a maximum oil adherence of 40 mg/10m. Do not used pipes that are crushed, deformed, or discolored (especially the inside surface). If these inferior pipes are used, impurities may clog the expansion valves or capillaries. / Because the pressure of ACs using R410A is higher than those using R22, it is essential that you select materials that are appropriate for these standards. / The thickness of the copper tubing used for R410A is shown in Table 10. Please be aware that tubing with a thickness of only 0.7 mm is also available on the market, but this should never be used.

Table 8 Difference between R410A and conventional charging hoses

Soft pipe		Thickness (mm)	
Nominal diameter	Outside diameter (mm)	R410A	(Reference) R22
1/4	6.35	0.80	0.80
3/8	9.52	0.80	0.80
1/2	12.7	0.80	0.80

10.3.2. Processing and Connecting Piping Materials

When working with refrigerant piping, the following points must be carefully observed: no moisture od dust must be allowed to enter the piping, and there must be no refrigerant leaks.

1. Procedure and precautions for flaring work

A. Cut the pipe / Use a pipe cutter, and cut slowly so the pipe will not be deformed.

B. Remove burrs and clean shavings from the cut surface / If the shape of the pipe end is poor after removing burrs, or if shavings adhere to the flared area, it may lead to refrigerant leaks. / To prevent this, turn the cut surface downward and remove burrs, then clean the surface, carefully.

C. Insert the flare nut (be sure to used the same nut that is used on the AC unit)

D. Flaring / Check the clamp bar and the cleanliness of the copper pipe. / Be sure to sued the clamp bar to do the flaring with accuracy. Use either an R410A flaring tool, or a conventional flaring tool. flaring tools come in different sizes, so be sure to check the size before using. When using a conventional flaring tool, use the copper pipe gauge for clearance adjustment, etc., to ensure the correct A dimension (see Fig. 10)

Fig. 10 Flaring dimensions

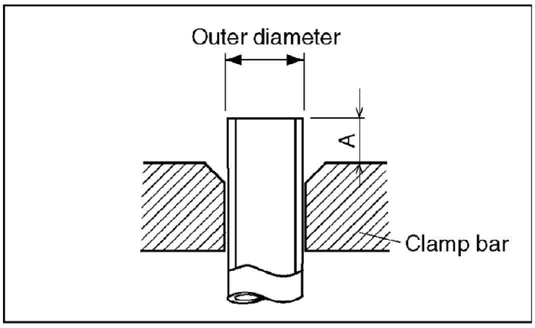
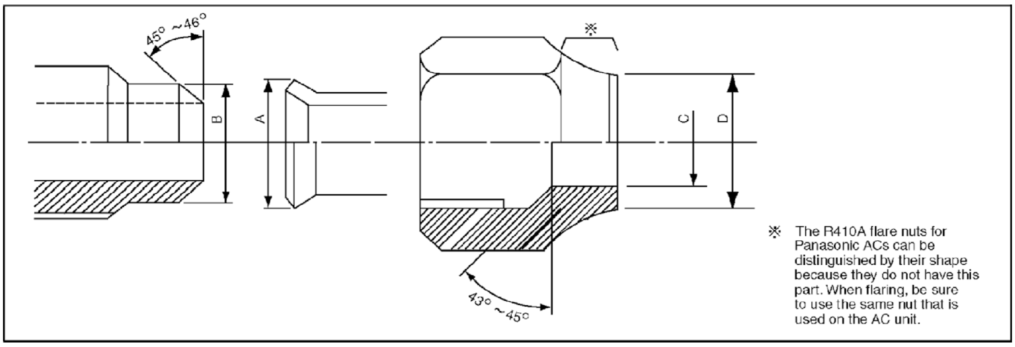


Fig. 11 Relation between the flare nut structure and flaring tool end



※ The R410A flare nuts for Panasonic ACs can be distinguished by their shape because they do not have this part. When flaring, be sure to use the same nut that is used on the AC unit.

Table 11 R410A flaring dimensions

Nominal diameter	Outside diameter (mm)	Wall thickness (mm)	A (mm)		
			R410A flaring tool, clutch type	Conventional flaring tool	
				Clutch type	Wing-nut type
1/4	6.35	0.8	0 - 0.5	1.0 - 1.5	1.5 - 2.0
3/8	9.52	0.8	0 - 0.5	1.0 - 1.5	1.5 - 2.0
1/2	12.70	0.8	0 - 0.5	1.0 - 1.5	2.0 - 2.5

Table 12 R410A flaring dimensions

Nominal diameter	Outside diameter (mm)	Wall thickness (mm)	A (mm)		
			R410A flaring tool, clutch type	Conventional flaring tool	
				Clutch type	Wing-nut type
1/4	6.35	0.8	0 - 0.5	0.5 - 1.0	1.0 - 1.5
3/8	9.52	0.8	0 - 0.5	0.5 - 1.0	1.0 - 1.5
1/2	12.70	0.8	0 - 0.5	0.5 - 1.0	1.5 - 2.0

Table 13 R410A flaring and flare nut dimensions Unit: mm

Nominal diameter	Outside diameter (mm)	Wall thickness (mm)	A +0, -0.4	B dimension	C dimension	D dimension	Flare nut width
1/4	6.35	0.8	9.1	9.2	6.5	13	17
3/8	9.52	0.8	13.2	13.5	9.7	20	22
1/2	12.70	0.8	16.6	16.0	12.9	23	26

Table 14 R410A flaring and flare nut dimensions Unit: mm

Nominal diameter	Outside diameter (mm)	Wall thickness (mm)	A +0, -0.4	B dimension	C dimension	D dimension	Flare nut width
1/4	6.35	0.8	9.0	9.2	6.5	13	17
3/8	9.52	0.8	13.0	13.5	9.7	20	22
1/2	12.70	0.8	16.2	16.0	12.9	20	24

2. Procedure and precautions for flare connection

A. Check to make sure there are no scratches, dust, etc., on the flare and union.

B. Align the flared surface with the axial center of the union.

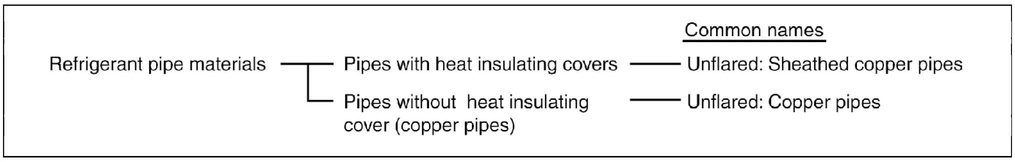
C. Use a torque wrench, and tighten to the specified torque. The tightening torque for R410A is the same as the conventional torque value for R22. Be careful, because if the torque is too weak, it may lead to a gas leak. If it is too strong, it may split the flare nut or make it impossible to remove the flare nut.

Table 15 R410A tightening torque

Nominal diameter	Outside diameter (mm)	Tightening torque N.m (kgf.cm)	Torque wrench tightening torque N.m (kgf.cm)
1/4	6.35	14 - 18 (140 - 180)	18 (180)
3/8	9.52	33 - 42 (330 -420)	42 (420)
1/2	12.70	55 (550)	55 (550)

10.3.3. Storing and Managing Piping Materials

1. Types of piping and their storage / The following is a general classification of the refrigerant pipe materials used for ACs.


Common names
Refrigerant pipe materials
Pipes with heat insulating covers
Unflared: Sheathed copper pipes
Pipes without heat insulating cover (copper pipes)
Unflared: Copper pipes

   Because the gas pressure of R410A is approximately 1.6 times as high as that of R22, copper pipes with the thickness shown in Table 10, and with minimal impurities must be used. Care must also be taken during storage to ensure that pipes are not crushed, deformed, or scratched, and that no dust, moisture or other substance enters the pipe interior. When storing sheathed copper pipes or plain copper pipes, seal the openings by pinching or taping them securely.

2. Makings and management
   A. Sheathed copper pipes and copper-element pipes / When using these pipes, check to make sure that they are the stipulated thickness. For flare nuts, be sure to used the same nut that is used on the AC unit.
   B. Copper pipes / Use only copper pipes with the thickness given in table 10, and with minimal impurities. Because the surface of the pipe is exposed, you should take special care, and also take measures such as marking the pipes to make sure they are easily distinguished from other piping materials, to prevent mistaken use.

3. Precautions during refrigerant piping work / Take the following precautions on-site when connecting pipes. (Keep in mind that the need to control the entry of moisture and dust is even more important that in conventional piping).
   A. Keep the open ends of all pipes sealed until connection with AC equipment is complete.
   B. Take special care when doing piping work on rainy days. The entering of moisture will degrade the refrigerating machine oil, and lead to malfunctions in the equipment.

C. Complete all pipe connections in as short a time as possible. If the pipe must be left standing for a long time after removing the seal, it must be thoroughly purged with nitrogen, or dried with a vacuum pump.

10.4. INSTALLATION, TRANSFERRING, SERVICING

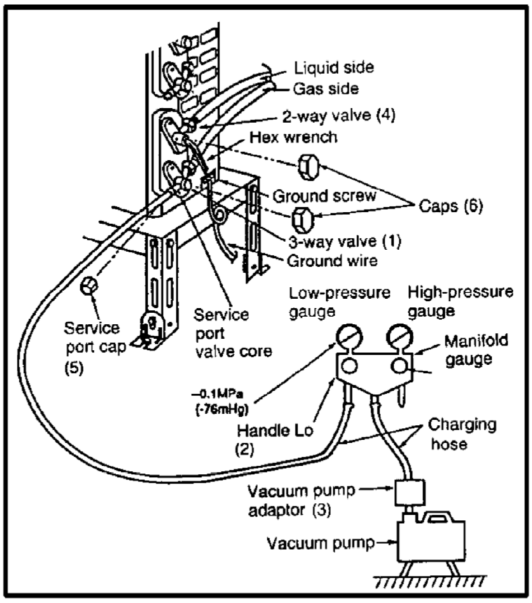
10.4.1. Inspecting Gas Leaks with a Vacuum Pump for New Installations (Using New Refrigerant Piping)

1. From the viewpoint of protecting the global environment, please do not release refrigerant into the atmosphere.
   A. Connect the projecting side (pin-pushing side) of the charging hose for the manifold gauge to the service port of the 3-way valve. (1)
   B. Fully open the handle Lo of the manifold gauge and run the vacuum pump. (2) (If the needle of the low-pressure gauge instantly reaches vacuum, re-check step a).)
   C. Continue the vacuum process for at least 15 minutes, then check to make sure the low-pressure gauge has reached -0.1 MPa (-76 cmHg). Once the vacuum process has finished, fully close the handle Lo of the manifold gauge and stop the vacuum pump operation, then remove the charging hose that is connected to the vacuum pump adaptor. (Leave the unit in that condition for 1-2 minutes, and make sure that the needle of the manifold gauge does not return.) (2) and (3)
   D. Turn the valve stem of the 2-way valve 90 counter-clockwise to open it, then, after 10 seconds, close it and inspect for a gas leak (4)
   E. Remove the charging hose from the 3-way valve service port, then open both the 2-way valve and 3-way valve. (1) (4) (Turn the valve stem in the counter-clockwise direction until it gently makes contact. Do not turn it forcefully).
   F. Tighten the service port cap with a torque wrench (18 N.m (1.8 kgf.m)). (5) Then tighten the 2-way valve and 3-way valve caps with a torque wrench (42 N.m (4.2 kgf.m)) or (55 N.m (5.5 kgf.m)).
   G. After attaching each of the caps, inspect for a gas leak around the cap area. (5) (6)

Precautions

- Be sure to read the instructions for the vacuum pump, vacuum pump adaptor and manifold gauge prior to use, and follow the instructions carefully.
- Make sure that the vacuum pump is filled with oil up to the designated line on the oil gauge.
- The gas pressure back flow prevention valve on the charging hose is generally open during use. When you are removing the charging hose from the service port, it will come off more easily if you close this valve.

Fig. 12 Vacuum pump air purging configuration


Liquid side
Gas side
2-way valve (4)
Hex wrench
Ground screw
Caps (6)
3-way valve (1)
Ground wire
Low-pressure gauge
High-pressure gauge
Manifold gauge
Service port cap (5)
Service port valve core
–0.1MPa (-76mHg)
Handle Lo (2)
Charging hose
Vacuum pump adaptor (3)
Vacuum pump

10.4.2. Transferring (Using New Refrigerant Piping)

1. Removing the unit

A. Collecting the refrigerant into the outdoor unit by pumping down / The refrigerant can be collected into the outdoor unit (pumping down) by pressing the TEST RUN button, even when the temperature of the room is low.

- Check to make sure that the valve stems of the 2-way valve and 3-way valve have been opened by turning them counter-clockwise. (Remove the valve stem caps and check to see that the valve stems are fully opened position. Always use a hex wrench (with 4-mm opposing sides) to operate the valve stems.)

- Press the TEST RUN button on the indoor unit, and allow preliminary for 5-6 minutes. (TEST RUN mode)
- After stopping the operation, let the unit sit for about 3 minutes, then close the 2-way valve by turning the valve stem in the clockwise direction.
- Press the TEST RUN button on the indoor unit again, and after 2-3 minutes of operation, turn the valve stem of the 3-way valve quickly in the clockwise direction to close it, then stop the operation.
- Tighten the caps of the 2-way valve and 3-way valve to the stipulated torque.
- Remove the connection pipes (liquid side and gas side).

2. Installing the unit / Install the unit using new refrigerant piping. Follow the instructions in section 4.1 to evacuate the pipes connecting the indoor and outdoor units, and the pipes of the indoor unit, and check for gas leaks.

10.4.3. AC Units Replacement (Using Existing Refrigerant Piping)

When replacing and R410A AC unit with another R410A AC unit, you should re-flare the refrigerant piping. Even though the replacement AC unit uses the R410A, problems occur when, for example, either the AC unit maker or the refrigerating machine oil is different. / When replacing an R22 AC unit with an R410A AC unit, the following checks and cleaning procedures are necessary but are difficult to do because of the chemical characteristics of the refrigerating machine oil (as described in items c) and d) of section 10.1.1.(2)). In this case, you should use new refrigerant piping rather than the existing piping.

1. Piping check / Because of the different pressure characteristics of R22 and R410A, the design pressure for the equipment is 1.6 times different. the wall thickness of the piping must comply with that shown in Table 10, but this is not easy to check. Also, even if the thickness is correct, there may be flattened or bent portions midway through the piping due to sharp curves. Buried sections of the piping also cannot be checked.

2. Pipe cleaning / A large quantity of refrigerating machine oil (mineral oil) adheres to existing pipes due to the refrigeration cycle circulation. If the pipes are used just as they are for the R410A cycle, the capacity will be lowered due to the incompatibility of this oil with the R410A, or irregularities may occur in the refrigeration cycle. For this reason, the piping must

be thoroughly cleaned, but this is difficult with the present technology.

10.4.4. Refrigerant Compatibility (Using R410A Refrigerant in R22 ACs and Vice Versa)

Do not operate an existing R22 AC with the new R410A refrigerant. Doing so would result in improper functioning of the equipment or malfunction, and might lead to a major accident such as an explosion in the refrigeration cycle. Similarly, do not operate an R410A AC with R22 refrigerant. The chemical reaction between the refrigerating machine oil used in R410A ACs and the chlorine that is contained in R22 would cause the refrigerating machine oil to degrade and lead to malfunction.

10.4.5. Recharging Refrigerant During Servicing

When recharging is necessary, insert the specified amount of new refrigerant in accordance with the following procedure.

1. Connect the charging hose to the service port of the outdoor unit.
2. Connect the charging hose to the vacuum pump adaptor. At this time, fully open the 2-way valve and 3-way valve.
3. Fully open the handle Lo of the manifold gauge, turn on the power of the vacuum pump and continue the vacuum process for at least one hour.
4. Confirm that the low pressure gauge shows a reading of -0.1 Mpa (-76 cmHg), then fully close the handle Lo, and turn off the vacuum pump. Wait for 1-2 minutes, then check to make sure that the needle of the Low pressure gauge has not returned. See Fig. 13 for the remaining steps of this procedure.
5. Set the refrigerant cylinder onto the electronic scale, then correct the hose the cylinder and to the connection port for the electronic scale. (1)(2)

   Precaution:

   Be sure to set up the cylinder for liquid charging. If you use a cylinder equipped with a siphon tube, you can charge the liquid without having to turn the cylinder around
6. Remove the charging hose of the manifold gauge from the vacuum pump adaptor, and connect it to the connection port of the electronic scale. (2)(3)
7. Open the valve of the refrigerant cylinder, then open the charging valve slightly and close it. Next, press the check valve of the

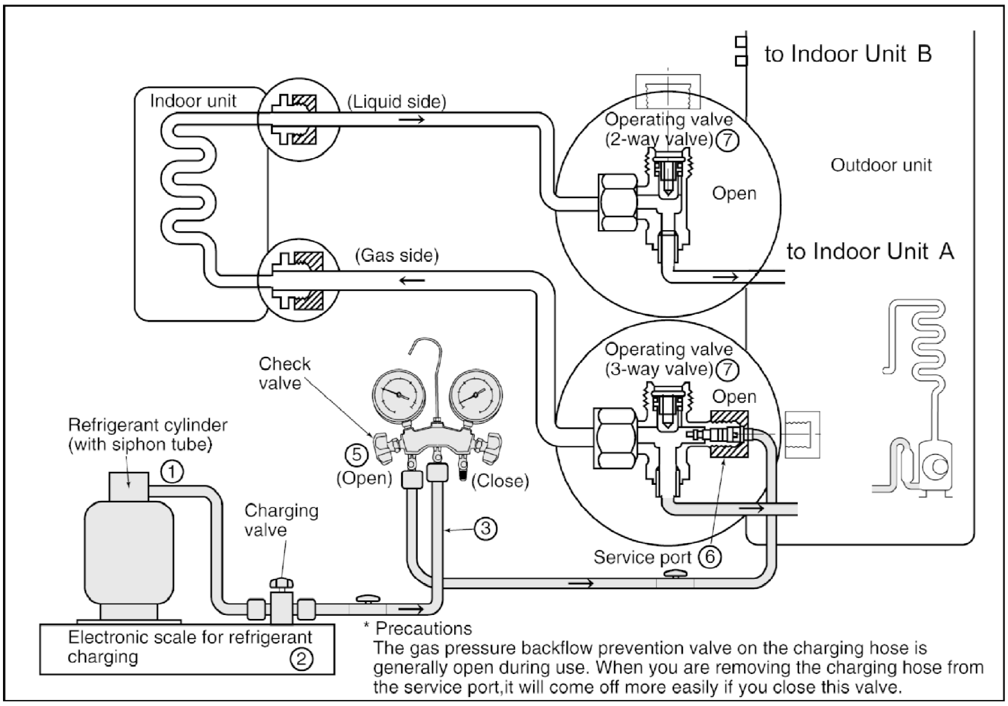
manifold gauge and purge the air. (2)(4) (Watch the liquid refrigerant closely at this point.)

8. After adjusting the electronic scale to zero, open the charging valve, then open the valve Lo of the manifold gauge and charge with the liquid refrigerant. (2)(5) (Be sure to read the operating instructions for the electronic scale.)
9. If you cannot charge the stipulated amount, operate the unit in the cooling mode while charging a little of the liquid at a time (about 150 g/time as a guideline). If the charging amount is insufficient from one operation, wait about one minute, then use the same procedure to do the liquid charging again.

   Precaution:

   Never use the gas side to allow a larger amount of liquid refrigerant to be charged while operating the unit.
10. Close the charging valve, and after charging the liquid refrigerant inside the charging hose, fully close the valve Lo of the manifold gauge, and stop the operation of the unit. (2)(5)
11. Quickly remove the charging hose from the service port. (6) If you stop midway through, the refrigerant that is in the cycle will be discharged.
12. After putting on the caps for the service port and operating valve, inspect around the caps for a gas leak. (6)(7)

Fig. 13 Re-charging refrigerant

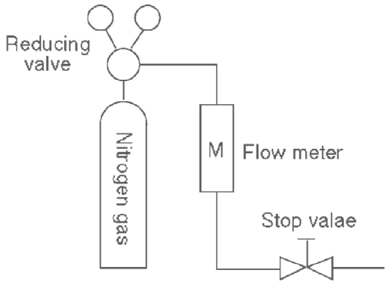

to Indoor Unit B
Indoor unit
(Liquid side)
Operating valve
(2-way valve) ⑦
Outdoor unit
Open
to Indoor Unit A
(Gas side)
Check
valve
Operating valve
(3-way valve) ⑦
Open
Refrigerant cylinder
(with siphon tube)
①
⑤
(Open)
(Close)
Charging
valve
③
Service port ⑥
Electronic scale for refrigerant
charging ②

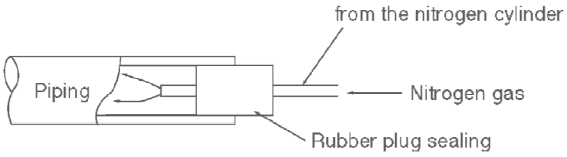
* Precautions
The gas pressure backflow prevention valve on the charging hose is generally open during use. When you are removing the charging hose from the service port,it will come off more easily if you close this valve.

10.4.6. Brazing

As brazing requires sophisticated techniques and experiences, it must be performed by a qualified person. / In order to prevent the oxide film from occurring in the pipe interior during brazing, it is effective to proceed with brazing while letting dry nitrogen gas (N2) flow.
<Brazing Method for Preventing Oxidation>

1. **Attach a reducing valve to the nitrogen gas cylinder.**
2. **Attach a reducing valve to the nitrogen gas cylinder.**
3. **Apply a seal onto the clearance between the piping and inserted pipe for the nitrogen gas in order to prevent the nitrogen gas from flowing backward.**
4. **When the nitrogen gas is flowing, be sure to keep the piping end open.**
5. **Adjust the flow rate of nitrogen gas so that it is lower than 0.05 m^3/h, or 0.02 MPa (0.2 kgf/cm^2) by means of the reducing valve.**
6. **After taking the steps above, keep the nitrogen gas flowing until the piping cools down to a certain extent (i.e. temperature at which pipes are touchable with finger).**
7. **Completely remove the flux after brazing.**





Cautions during brazing

1. General Cautions
   - A. The brazing strength should be high as required.
   - B. After operation, airtightness should be kept under pressurized condition.
   - C. During brazing do not allow component materials to become damaged due to overheating.
   - D. The refrigerant pipe work should not become blocked with scale or flux.
   - E. The brazed part should not restrict the flow in the refrigerant circuit.
   - F. No corrosion should occur from the brazed part.
2. Preventing of Overheating

   Due to heating, the interior and exterior surfaces of treated metal may oxidize. Especially, when the interior of the refrigerant circuit oxidizes due to overheating, scale occurs and stays in the circuit as dust, thus exerting a fatally adverse effect. So, make brazing at adequate brazing temperature and with minimum of heating area.
3. Overheating Protection

   In order to prevent components near the brazed part from overheating damaged or quality deterioration due to flame or heat, take adequate steps for protection such as (1) by shielding with a metal plate, (2) by using a wet cloth, and (3) by means of heat absorbent.
4. Movement during Brazing

   Eliminate all vibration during brazing to protect brazed joints from cracking and breakage.
5. Oxidation Preventative

   In order to improve the brazing efficiency, various types of

antioxidant are available on the market. However, the constituents of these are widely varied, and some are anticipated to corrode the piping materials, or adversely affect HFC refrigerant, lubricating oil, etc. Exercise care when using an oxidation preventive.

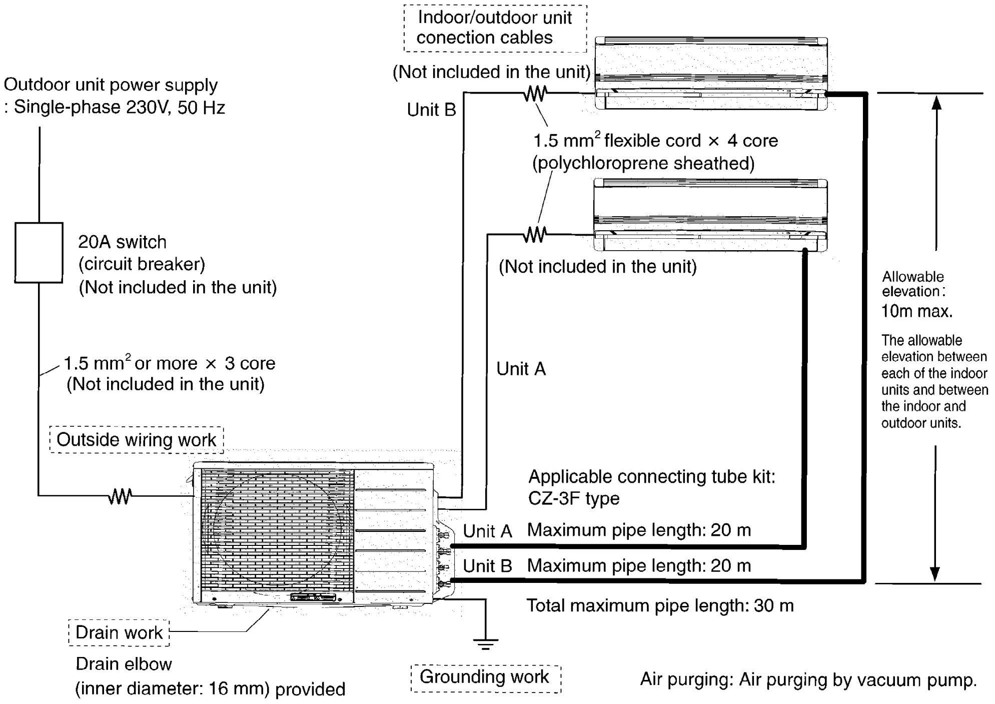
10.4.7. Servicing Tips

The drier must also be replaced whenever replacing the refrigerant cycle parts. Replacing the refrigerant cycle parts first before replacing the drier. The drier is supplied in a vacuum pack. Perform brazing immediately after opening the vacuum pack, and then start the vacuum within two hours. In addition, the drier also needs to be replaced when the refrigerant has leaked completely.

11. Installation Information

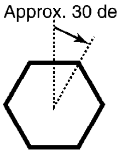
11.1. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)

11.1.1. Check Points


Indoor/outdoor unit conection cables
(Not included in the unit)
Outdoor unit power supply
: Single-phase 230V, 50 Hz
Unit B
1.5 mm² flexible cord × 4 core
(polychloroprene sheathed)
20A switch
(circuit breaker)
(Not included in the unit)
(Not included in the unit)
Allowable elevation:
10m max.
The allowable elevation between each of the indoor units and between the indoor and outdoor units.
1.5 mm² or more × 3 core
(Not included in the unit)
Unit A
Outside wiring work
Applicable connecting tube kit:
CZ-3F type
Unit A Maximum pipe length: 20 m
Unit B Maximum pipe length: 20 m
Total maximum pipe length: 30 m
Drain work
Drain elbow
(inner diameter: 16 mm) provided
Grounding work
Air purging: Air purging by vacuum pump.

11.1.2. The Shapes of the 3-way Valve Caps of the Outdoor Unit have been Changed.

- **Accompanying the changes in the shapes of the 3-way valve caps, the tightening method has also been changed.**
- **Firmly tighten the 3-way valve caps by hand, and then tighten them up by another 30 degrees or so (one-twelfth of a full turn) using a spanner or adjustable spanner.**

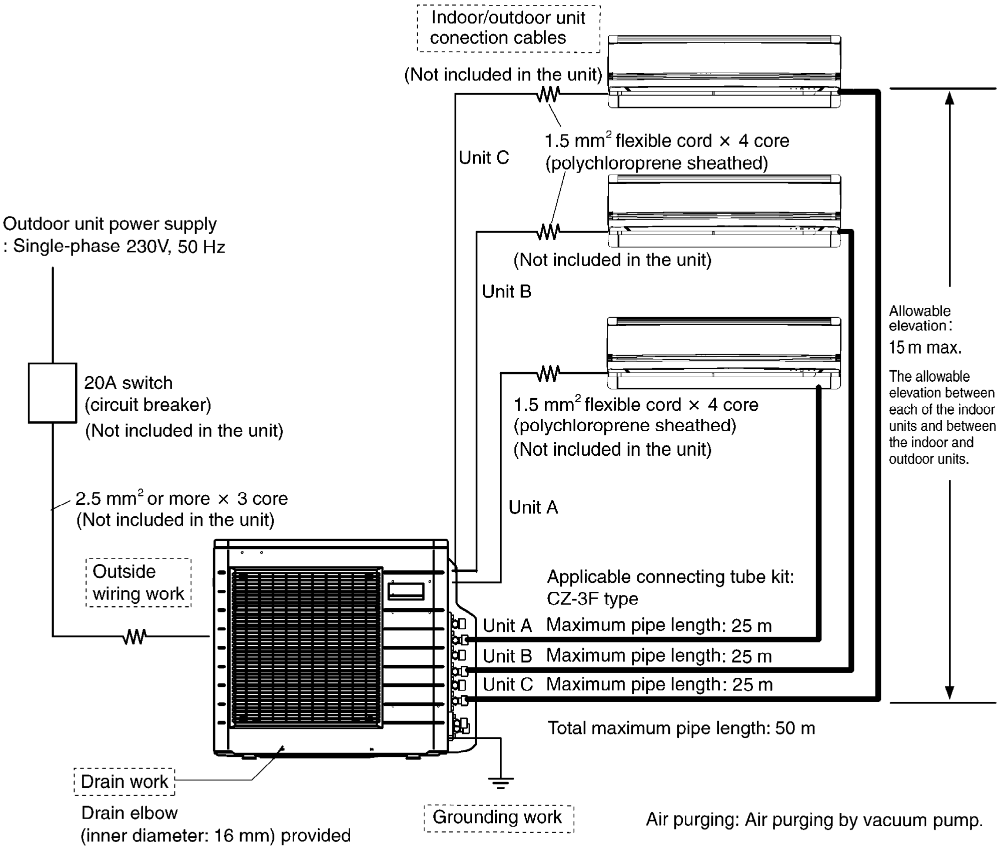

Approx. 30 degrees

After having firmly tightened the caps by hand, tighten them up further using a spanner or adjustable spanner.

Caution:
Do not use all your strength to tighten up the caps. Doing so may break the caps.

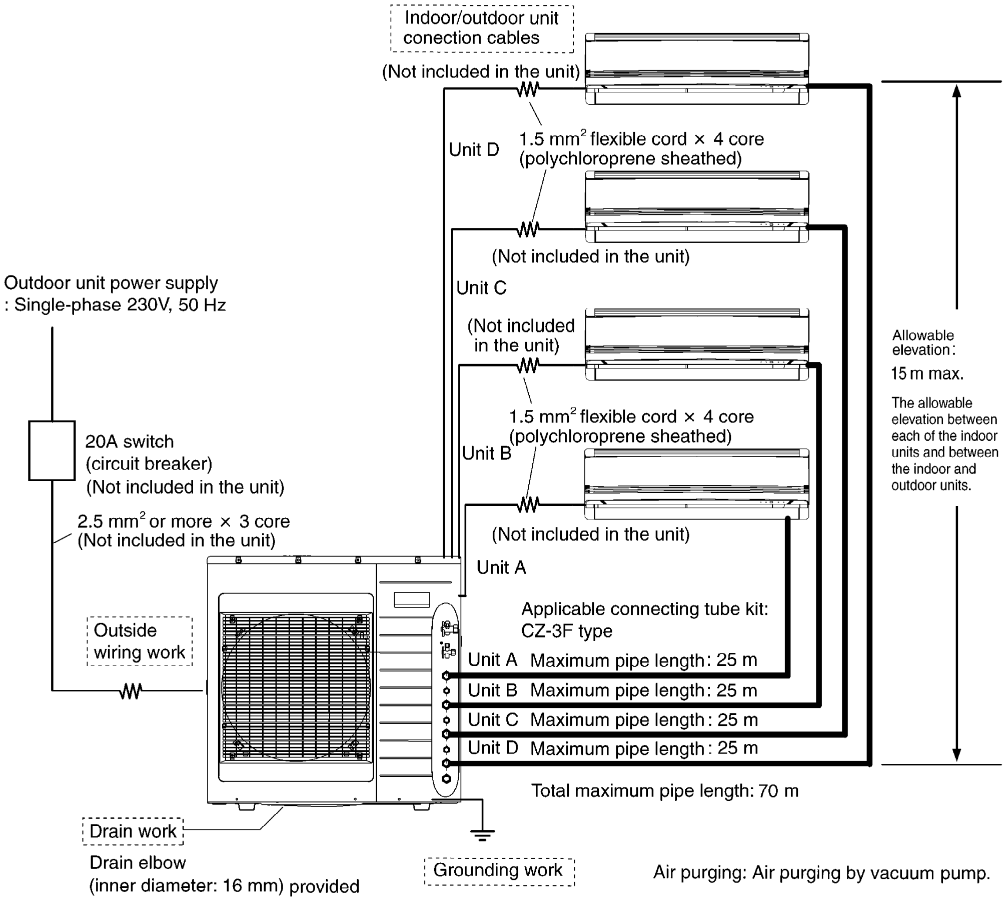
11.2. OUTDOOR UNIT (CU-3E23CBPG)

11.2.1. Check Points


Indoor/outdoor unit conection cables
(Not included in the unit)
1.5 mm² flexible cord × 4 core (polychloroprene sheathed)
Unit C
Outdoor unit power supply : Single-phase 230V, 50 Hz
(Not included in the unit)
Unit B
Allowable elevation: 15 m max.
The allowable elevation between each of the indoor units and between the indoor and outdoor units.
20A switch (circuit breaker)
(Not included in the unit)
1.5 mm² flexible cord × 4 core (polychloroprene sheathed)
(Not included in the unit)
Unit A
2.5 mm² or more × 3 core
(Not included in the unit)
Outside wiring work
Applicable connecting tube kit: CZ-3F type
Unit A Maximum pipe length: 25 m
Unit B Maximum pipe length: 25 m
Unit C Maximum pipe length: 25 m
Total maximum pipe length: 50 m
Drain work
Drain elbow (inner diameter: 16 mm) provided
Grounding work
Air purging: Air purging by vacuum pump.

11.3. OUTDOOR UNIT (CU-4E27CBPG)

11.3.1. Check Points


Indoor/outdoor unit conection cables
(Not included in the unit)
Unit D
1.5 mm² flexible cord × 4 core (polychloroprene sheathed)
(Not included in the unit)
Unit C
Outdoor unit power supply
: Single-phase 230V, 50 Hz
(Not included in the unit)
1.5 mm² flexible cord × 4 core (polychloroprene sheathed)
Unit B
20A switch
(circuit breaker)
(Not included in the unit)
2.5 mm² or more × 3 core
(Not included in the unit)
(Not included in the unit)
Unit A
Allowable elevation: 15 m max.
The allowable elevation between each of the indoor units and between the indoor and outdoor units.
Outside wiring work
Applicable connecting tube kit: CZ-3F type
Unit A Maximum pipe length: 25 m
Unit B Maximum pipe length: 25 m
Unit C Maximum pipe length: 25 m
Unit D Maximum pipe length: 25 m
Total maximum pipe length: 70 m
Drain work
Drain elbow
(inner diameter: 16 mm) provided
Grounding work
Air purging: Air purging by vacuum pump.

11.3.2. The Pipe Diameter for the 4.0 kW or Above Models has been Reduced.

- **1/4” and 3/8” pipes are used for models with a rated cooling capacity of up to 5.0 kW.**
- **Applicable connecting tube kit: CZ-3F type.**

11.4. PIPING LENGTH

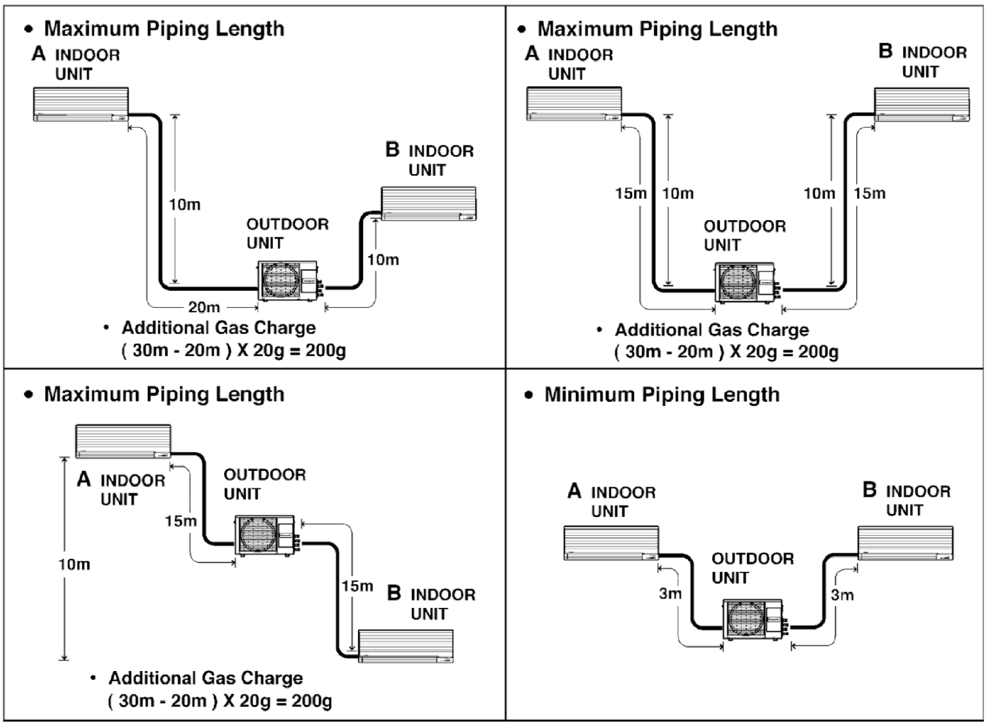
(In case of CU-2E15CBPG)

Piping size		Common Length (m)	Min. total Length (m)	Max. total Length (m)	Max. Elevation (m)	Additional gas charge amount (g/m)
Gas	Liquid					
3/8"	1/4"	20	6 (3m / Indoor unit)	30 *1	10	20 *2

Note:

*1. It is possible to extend the piping length of one unit up to 20 meters. However, the total piping length must not exceed 30 meters.

*2. If the piping length exceeds 20 meters, refrigerant of 20g per meter must be added.


• Maximum Piping Length
A INDOOR UNIT
B INDOOR UNIT
10m
OUTDOOR UNIT
10m
20m
• Additional Gas Charge
(30m - 20m) X 20g = 200g
• Maximum Piping Length
A INDOOR UNIT
B INDOOR UNIT
15m
10m
10m
15m
OUTDOOR UNIT
• Additional Gas Charge
(30m - 20m) X 20g = 200g
• Maximum Piping Length
A INDOOR UNIT
OUTDOOR UNIT
15m
10m
15m
B INDOOR UNIT
• Additional Gas Charge
(30m - 20m) X 20g = 200g
• Minimum Piping Length
A INDOOR UNIT
B INDOOR UNIT
OUTDOOR UNIT
3m
3m

12. Installation Instruction

12.1. INDOOR UNIT

12.2. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)

12.3. OUTDOOR UNIT (CU-3E23CBPG/CU-4E27CBPG)

13. Servicing Information

13.1. TROUBLESHOOTING

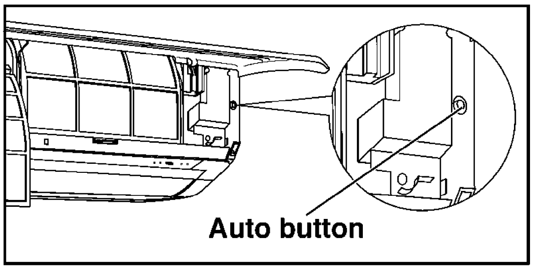
13.1.1. Rated Frequency Operation

During troubleshooting and servicing, rated compressor operating frequency must be obtained in order to check the specification and technical data. Below are the methods used to obtain rated compressor operating frequency.

1. Cooling

- Press the AUTO button for 5-8 seconds on the indoor unit.

The air conditioner starts operation at Cooling rated frequency.



2. Heating

Keep pressing the AUTO button for 8-11 seconds. The air conditioner starts operation at Heating rated frequency.

13.1.2. Troubleshooting Air Conditioner

Refrigeration cycle system

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor or a fan.

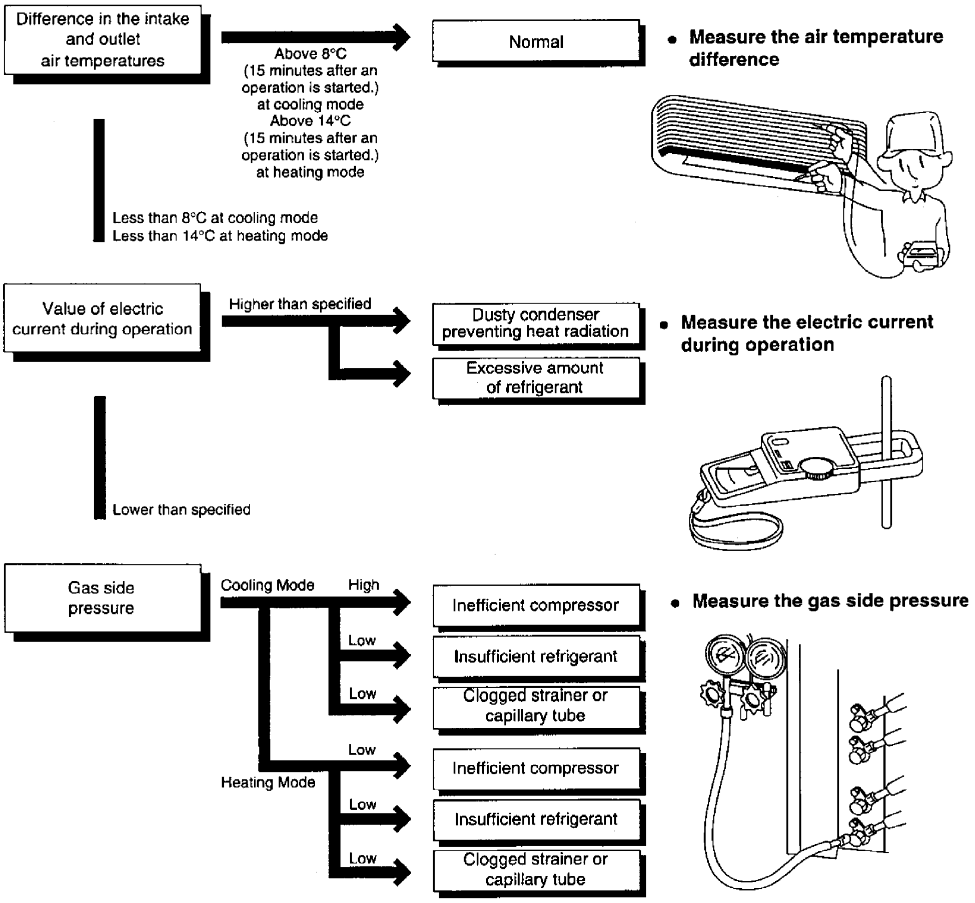
The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions; the standard values for them are shown in the following table.

	Gas pressure MPa (kg/cm2G)	Outlet air temperature (°C)
Cooling Mode	0.9 - 1.1 (9 - 11)	15 - 17
Heating Mode	2.1 - 2.8 (21 - 28)	35 - 41

*** In case of CU-2E15CBPG/2E18CBPG**

Condition:

- **Indoor fan speed; High**
- **Outdoor temperature is 35 °C at cooling mode and 7 °C at heating mode.**
- **Compressor operates at rated frequency.**


Difference in the intake and outlet air temperatures
Above 8°C (15 minutes after an operation is started.) at cooling mode
Above 14°C (15 minutes after an operation is started.) at heating mode
Normal
• Measure the air temperature difference
Less than 8°C at cooling mode
Less than 14°C at heating mode
Value of electric current during operation
Higher than specified
Dusty condenser preventing heat radiation
Excessive amount of refrigerant
• Measure the electric current during operation
Lower than specified
Gas side pressure
Cooling Mode
High
Inefficient compressor
Low
Insufficient refrigerant
Low
Clogged strainer or capillary tube
• Measure the gas side pressure
Heating Mode
Low
Inefficient compressor
Low
Insufficient refrigerant
Low
Clogged strainer or capillary tube

Relationship between the condition of the air conditioner and pressure and electric current

Condition of the air conditioner	Cooling Mode			Heating Mode		
	Low Pressure	High Pressure	Electric current during operation	Low Pressure	High Pressure	Electric current during operation
Insufficient refrigerant (gas leakage)	↘	↘	↘	↘	↘	↘
Clogged capillary tube or Strainer	↘	↘	↘	↗	↗	↗
Short circuit in the indoor unit	↘	↘	↘	↗	↗	↗
Heat radiation deficiency of the outdoor unit	↗	↗	↗	↘	↘	↘
Inefficient compression	↗	↗	↗	↘	↘	↘

· Carry out the measurements of pressure, electric current, and temperature fifteen minutes after an operation is stated.

13.2. SELF DIAGNOSIS DISPLAY

13.2.1. Indoor Unit

[Table of diagnosis methods]

Symbol	Diagnosis	Diagnosis method
H11	Indoor/Outdoor abnormal communication	This trouble display appears when indoor/outdoor unit communication established after 30 or more seconds. <Diagnosis checkpoint> 1. Measure the voltages of the indoor/outdoor unit communication cables, and check whether the vol supplied properly to the outdoor unit or whether it is being returned from the outdoor unit to the indo
H12	Indoor unit capacity unmatched	This trouble display appears when wrong in the total connection capaci wrong connection in each capacity. The trouble is determined within 2 minutes after the power is turned on <Diagnosis checkpoint> 1. Check the total capacity of the units connected and check that the models are compatible for conn
H14	Intake air temp. sensor	This trouble display appears when the intake air temperature has excee above 46 °C continuously for 2 minutes or dropped below -54 °C contin 5 seconds during operation. <Diagnosis checkpoint> 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 k Ω) or short-circuiting (less than 6.5 k Ω) is defective contact of the connector is to blame.
H16	Outdoor Current Transformer	CU-2E: When a value of under 1.5A has been detected for the total current duri operation beyond the set capacity, the compressor operates with its op frequency controlled to a maximum of 38 Hz for 3 minutes, and if it cont operate at a total current of under 1.5A for another 3 minutes, its operat CU-3E/4E: When the total current has dropped below the set current level continu 20 seconds during operation beyond the set capacity, operation is stop Three minutes later, operation is started up again, and when the trouble on 4 successive occasions, the trouble display appears (the timer lamp <Diagnosis checkpoint> 1. Check the refrigerating cycle: Gas may be leaking (the amount of refrigerant is extremely low). 2. Check the control P.C. Board: Check for a broken wire (open circuit) in the current transformer. (If circuit is found, replace the control P.C. Board.) In the case of a scroll compressor (DC motor), H16 is detected only when the regular compressor is
H19	Indoor fan motor mechanism lock	-High-voltage PWM: When a state in which the fan motor speed is not synchronized with the control been detected on 7 successive occasions: -Low-voltage PAM: When the fan lock detection signal has been detected on 7 successive occasions detected continuously for 25 seconds or when a state in which the fan motor speed is not synchroniz control signal has been detected on 7 successive occasions: The trouble display appears (the timer lamp blinks). <Diagnosis checkpoint> 1. Check the nature of the fan lockup trouble. 2. Check for disconnections of the fan motor connectors and for defects in contact, in the fan motor control P.C. Board.

Symbol	Diagnosis	Diagnosis method
H23	Indoor heat exchanger temp. sensor	This trouble display appears when a temperature of under approximatel or above approximately 80 °C has been detected by the heat exchanger temperature sensor continuously for 5 seconds. (This trouble is not detected during de-icing.) <Diagnosis checkpoint> 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 2.5 kΩ) is defective contact of the connector or a defective control P.C. Board is to blame.
H27	Outdoor air temp. sensor	This trouble display appears when a temperature of under approximatel or above approximately 150 °C has been detected by the outside air tem sensor for 2 to 5 seconds. (This trouble is not detected during de-icing. <Diagnosis checkpoint> 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 0.5 kΩ) is defective contact of the connector or a defective control P.C. Board is to blame.
H28	Outdoor heat exchanger temp. sensor 1	This trouble display appears when a temperature of under approximatel or above approximately 110 °C has been detected by the heat exchange temperature sensor for 2 to 5 seconds. (This trouble is not detected dur icing.) <Diagnosis checkpoint> 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 0.5 kΩ) is defective contact of the connector or a defective control P.C. Board is to blame.
H30	Outdoor discharge pipe temp. sensor	CU-2E: This trouble display appears when a temperature of under approximatel or above approximately 200 °C has been detected by the outlet tempera sensor for 2 to 5 seconds. CU-3E/4E: Disconnected discharge sensor -When the condensation temperature is higher than the discharge temperature + (plus) 6 °C, a senso disconnection is detected, operation stops, and the trouble display appears (the timer lamp blinks). <Diagnosis checkpoint> 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 0.5 kΩ) is defective contact of the connector or a defective control P.C. Board is to blame.
H32	Outdoor heat exchanger temp. sensor 2 (discharge pipe temp.)	This trouble display appears when a temperature of under approximatel or over approximately 110 °C has been detected continuously for 2 to 5 by the outlet temperature sensor of the heat exchanger. <Diagnosis checkpoint> 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 0.5 kΩ) is defective contact of the connector or a defective control P.C. Board is to blame.

Symbol	Diagnosis	Diagnosis method
H34	Outdoor heat sink temp. sensor	This trouble display appears when a temperature of under -43 °C or abo has been detected by the outdoor unit radiator fin sensor continuously seconds. **<Diagnosis checkpoint>** 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 0.5 kΩ) i defective contact of the connector or a defective control P.C. Board is to blame.
H36	Abnormal gas pipe temp. sensor	This trouble display appears when a temperature of under approximatel or above approximately 149 °C has been detected by the outdoor unit ga pipe temperature sensor continuously for 2 to 5 seconds. **<Diagnosis checkpoint>** 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 0.5 kΩ) i defective contact of the connector or a defective control P.C. Board is to blame.
H37	Outdoor liquid pipe temp. sensor	This trouble display appears when a temperature of under -45 °C or abo has been detected by the outdoor unit liquid side pipe temperature sens continuously for 2 seconds. **<Diagnosis checkpoint>** 1. This trouble display appears when a temperature which is impossibly high or low from a normal st been detected. Check the sensor, and if open-circuiting (more than 500 kΩ) or short-circuiting (less than 0.5 kΩ) i defective contact of the connector or a defective control P.C. Board is to blame.
H39	Abnormal indoor operating unit or standby units	This display appears in rooms other than one in which indoor freezing t has occurred when the pipes have been connected incorrectly, when ar expansion valve is defective or when an expansion valve connector has disconnected.
H41	Abnormal wiring or piping connection	CU-2E only This display appears when this kind of trouble is detected 3 minutes aft forced cooling operation was conducted for one room during the initial after the power was turned on. It appears when: -The indoor unit pipe temperature in a room without the capacity supply available at an outside air te above 5 °C has dropped by more than 20 °C to 5 °C or lower 3 minutes after the compressor started u -The outdoor unit gas pipe temperature in a room without the capacity supply available has dropped 5 °C to 5 °C or lower 3 minutes after the compressor started up.

Symbol	Diagnosis	Diagnosis method
H97	**Outdoor fan motor mechanism lock**	**CU-2E:** **When trouble, which is defined as a state in which the fan motor speed synchronized with the control signal has been detected on 5 successiv occasions, has occurred for the third time in a 60-minute period and twi a 30-minute period, the trouble display appears, and operation stops.** **CU-3E/4E:** **When the fan motor speed detected when its maximum output is demar below 30 rpm continuously for 15 seconds, the fan motor stops for 3 mi then restarted.** **When this happens on 16 occasions (the trouble display is cleared whe value is normal for 5 minutes), the H97 diagnostic symbol is stored in t memory, and the fan motor stops.** **<Diagnosis checkpoint>** **1. Check the nature of the fan lockup trouble.** **2. Check for disconnections of the fan motor connectors and for defects in contact, in the fan motor control P.C. Board.**
H98	**Indoor high pressure protection**	**The restriction on the compressor frequency is started when the tempe the indoor unit heat exchanger source is between 50 °C and 52 °C, the compressor stops at a temperature from 62 °C to 65 °C, it is restarted 3 later at below 62 °C to 65 °C, and the restriction on the compressor freq released at a temperature between 48 °C and 50 °C. (No trouble display** **<Diagnosis checkpoint>** **1. Check the indoor unit heat exchanger temperature sensor (check for changes in its characteristics resistance): Symptoms include no hot start when operation is started, a failure of the thermostat to t outdoor unit operation). And frequent repetition of stopping and startup.** **2. Check also for short circuits indoors and clogging of the air filters.**
H99	**Indoor operating unit freezing**	**The restriction on the compressor frequency is started when the indoor exchanger temperature is between 8 °C and 12 °C. Operation stops if a temperature below 0 °C continues for 6 minutes. Three minutes later, o started up at a temperature from 3 °C to 8 °C. The restriction on the com frequency is released at a temperature between 13 °C and 14 °C.** **<Diagnosis checkpoint>** **1. A cooling or dry mode operation conducted at a low outside air temperature is mainly to blame: thi indicative of any malfunctioning.** **If the outside air temperature rises during automatic operation in the winter months, the dry mode op selected. The H99 diagnostic display also appears at such a time.** **2. Check the refrigerating cycle: Gas may be leaking (the amount of refrigerant is low) or a pipe may** **3. Check also for short circuits indoors and clogging of the air filters.**

Symbol	Diagnosis	Diagnosis method
F11	**4-way valve switching failure**	**CU-2E:** **When the indoor unit heat exchanger temperature is under -5 °C during** **warming operation or above 45 °C during a cooling or dry mode operati** **minutes after the compressor has started up, the F11 diagnostic symbo** **in the memory, and operation stops. 3 minutes later, operation is resta** **trouble display appears when this happens on 4 occasions in a 30-minu** **CU-3E/4E:** **When a difference of 0 °C to 5 °C has been detected between the outdo** **heat exchanger temperature and liquid side pipe temperature on 5 occa** **trouble display appears.** **<Diagnosis checkpoint>** **1. Check the 4-way valve coil: Check that no power is supplied to the coil during cooling and dry mo** **and that power is supplied during heating operations. Inspect the coil for broken wires (open circuits** **2. If the coil is trouble-free, the switching action of the 4-way valve may be defective.**
F17	**Indoor standby units freezing**	**CU-2E:** **After the operation of one indoor unit stops continuously for 5 minutes.** **operation stops when the stopping indoor unit pipe temperature is und** **continuously for 1 minute or under 0 °C continuously for 5 minutes, an** **operation restarts after 3 minutes. This trouble display appears if that t** **happens on 3 occasions in a 30-minute period.** **CU-3E/4E:** **When the difference of an intake temperature (room temperature senso** **indoor unit heat exchanger temperature (piping sensor) is higher than 1** **indoor unit heat exchanger temperature of below -1 °C has been detect** **continuously for 5 minutes, operation stops. Three minutes later, it is st** **and the trouble display appears when this has occurred on 3 consecuti** **occasions.** **<Diagnosis checkpoint>** **1. Check the refrigerating cycle: Expansion valve leakage** **2. Check the indoor unit pipe temperature sensor (check for changes in its characteristics and check**
F90	**PFC circuit protection (CU-2E)** **Main circuit low voltage (CU-3E/4E)**	**CU-2E:** **When the rotation of the compressor is not synchronized with the cont** **the F90 diagnostic display is stored in the memory, and operation stops** **minutes later, operation is restarted. This trouble display appears when** **happens on 4 occasions in a 10-minute period.** *** With the multi 53 or above, it appears when this happens on 16 occasi** **CU-3E/4E:** **When a DC voltage below 305V to 328V has been detected on 16 occasi** **trouble display appears.** **<Diagnosis checkpoint>** **1. To check whether the 2-way or 3-way valve has been left open by mistake, operation is performed** **several minutes after the compressor has started up, F93 is stored in the memory as the symptom, a** **stops.** **2. Check the inverter circuit (for open circuits) in the control P.C. Board: Check the IPM base current** **within 3 minutes after the power has been turned back on. As the symptom, F93 is stored in the mem** **seconds after the compressor has started up, and operation stops. The trouble display appears after** **3. Check for broken wires (open circuits) in the compressor winding: Approximately 1 ohm under no** **conditions for each phase (same symptom as in 2.)** **4. Check the power supply voltage has been down or not.**

Symbol	Diagnosis	Diagnosis method
F91	**Refrigeration cycle abnormality**	**CU-2E:** **When the rotation speed of the compressor exceeds the setting frequer the total current is 1.5A or higher to 1.9A or lower continuously for 5 mi operation stops if the indoor unit heat exchanger temperature is higher C during cooling or dry operation or if it is under 25 °C during heating. T minutes later, it is restarted, and if the trouble occurs on 2 consecutive occasions in a 20-minute period, the trouble display appears.** **CU-3E/4E:** **When the compressor frequency is above 55 Hz and the current drops b prescribed level continuously for 7 minutes, operation stops, and it is re minutes later.** **When the compressor discharge temperature has exceeded the setting expansion valve has remained fully open for 80 seconds, operation stop is restarted 3 minutes later.** **When the stopping described above has occurred on 4 occasions, oper stops, and the trouble display appears.** **<Diagnosis checkpoint>** **1. Check the refrigerating cycle: Gas may be leaking (more than one-half of the volume of the gas has diagnostic displays resulting from a gas leak generally change in the following sequence depending of the gas leak: H99 → F97 → F91 → H16.** **The range of this trouble (F91) is limited. (Compressor protection at the start of the season)**
F93	**Compressor abnormal revolution**	**CU-2E:** **When the rotation of the compressor is not synchronized with the contr the F93 diagnostic display is stored in the memory, and operation stops minutes later, operation is restarted. This trouble display appears when happens on 4 occasions in a 20-minute period.** **CU-3E/4E:** **When a state in which the rotation of the compressor is not synchroniz the control signal has been detected on 8 successive occasions, operat and the trouble display appears.** **<Diagnosis checkpoint>** **1. To check whether the 2-way or 3-way valve has been left open by mistake, operation is performed f several minutes after the compressor has started up, F93 is stored in the memory as the symptom, ar stops.** **2. Check the inverter circuit (for open circuits) in the control P.C. Board: Check the IPM base current within 3 minutes after the power has been turned back on. As the symptom, F93 is stored in the mem seconds after the compressor has started up, and operation stops. The trouble display appears after** **3. Check for broken wires (open circuits) in the compressor winding: Approximately 1 ohm under nor conditions for each phase (same symptom as in 2.)**
F95	**Outdoor high pressure protection**	**CU-2E only** **When the temperature of the outdoor unit heat exchanger temperature s exceeds 62 °C, the F95 diagnostic symbol is stored in the memory, and stops. 13 minutes later, operation is restarted at a temperature below 48 trouble display appears when this happens on 4 occasions in a 20-minu** **<Diagnosis checkpoint>** **1. Check the outdoor unit heat exchanger temperature sensor (check for changes in its characteristic its resistance).** **2. Check whether something is interfering with the dissipation of the heat outdoors.**

Symbol	Diagnosis	Diagnosis method
F96	**Power transistor module or compressor overheating (CU-2E)**	**CU-2E:** **Heating is detected inside the IPM which shuts itself off, the F96 diagno symbol is stored in the memory, and operation stops. 3 minutes later, o is restarted. The trouble display appears when this happens on 4 occas 30-minute period.** **CU-3E/4E:** **When this trouble is detected from the electrical parts radiation fin temp sensor and OLP output during operation, operation stops, and it is resta minutes later. If the trouble occurs on 4 occasions, operation stops, and trouble display appears.** **<Diagnosis checkpoint>** **1. Something may be interfering with the dissipation of the heat outdoors or the outdoor unit fan may (The outdoor unit fan is not running.)** **2. Defective IPM (outdoor unit control P.C. Board)** **3. Gas leaks. 2-way or 3-way valve is not opened.**
	Compressor high discharge temperature (CU-3E/4E)	
F97	**Compressor high discharge temperature**	**When the temperature of the compressor temperature sensor exceeds 1 °C, the F97 diagnostic symbol is stored in the memory, and operation st minutes later, operation is restarted at a temperature below 107 to 110 °** **CU-2E: The trouble display appears and operation stops when this happ occasions in a 30-minute period.** **CU-3E/4E: This trouble display appears and operation stops when this h on 6 occasions (it is cleared when the operation is normal for 20 minute** **<Diagnosis checkpoint>** **1. Check the refrigerating cycle: Gas may be leaking (the amount of refrigerant is low). The stopping unit from time to time is a symptom of this trouble.** **2. When operation steps with this trouble display appearing, check the compressor temperature sens changes in its characteristics and check its resistance).** **3. Something may be interfering with the dissipation of the heat outdoors or the outdoor unit fan may (The fan will not run because of an open circuit.)** **(The protection function may be activated by an overload, and the F97 trouble display will remain stor memory.)**
F98	**Total running current protection**	**CU-2E:** **When the total current exceeds the setting, the F98 diagnostic display is in the memory, and operation stops. 3 minutes later, operation is restar trouble display appears and operation stops when this happens on 3 oc in a 20-minute period.** **CU-3E/4E:** **When the total current exceeds the setting (17A to 20A), frequency cont started, and if it then exceeds the setting, operation stops, and the troul display appears.** **<Diagnosis checkpoint>** **1. Check the AC voltage at the outdoor unit terminal board during operation: The voltage drop must b the voltage when operation has stopped (± 110% of rated voltage even during operation). If the voltag exceeds 5% or if the voltage changes suddenly, inspect whether the power supply cord and indoor/ou connection cables are too long or too small in diameter, etc.** **2. heck whether something is interfering with the dissipation of the heat outdoors (during cooling op Normally, the capacity is limited by the current so that the outdoor unit don't stop, and the diagnostic not appear.**

Symbol	Diagnosis	Diagnosis method
F99	**DC peak detection**	**CU-2E:** **If the current level exceeds 22.5A after startup, the compressor stops, a restarted 3 minutes later. When this occurs on 7 consecutive occasions operation stops, and the trouble display appears.** **CU-3E/4E:** **When "Output current trouble", which occurs when the prescribed curr is exceeded, has occurred on 16 consecutive occasions, operation stop trouble display appears.** **<Diagnosis checkpoint>** **1. Check whether the compressor is defective (locked up or shorted winding). Check the outdoor uni Board.**

13.2.2. OUTDOOR UNIT (CU-3E23CBPG/4E27CBPG)

〈 LED on outdoor unit pcb 〉

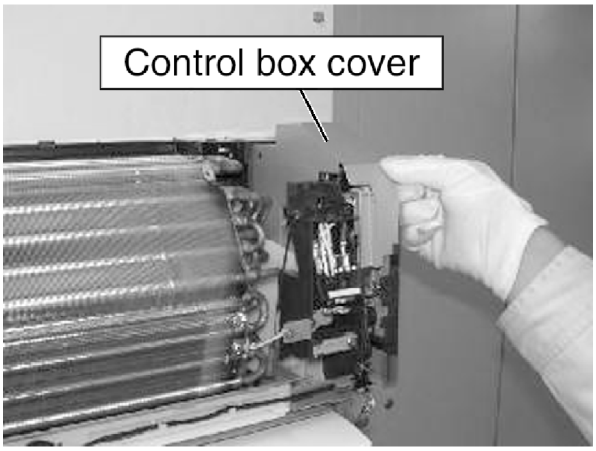
Green	Normally flashing	◑	Flashing
Red	Normally OFF	●	OFF
☼	ON	—	Irrelevant

Self diagnosis symbol Code	Green	Red				DIAGNOSIS
	Micro-computer normal -ED-A	Malfunction detection				
		LED 1	LED 2	LED 3	LED 4	
—	◑	●	●	●	●	Normal → Check indoor units
H98,H99,F17	◑	☼	●	☼	☼	Indoor high pressure protection or freeze-up operating unit or standby unit
F97	◑	☼	●	☼	●	Compressor overheating or high discharge
F93	◑	●	☼	☼	●	Compressor abnormal revolution
F98	◑	●	☼	●	☼	Total running current protection
H16,H17	◑	☼	☼	●	●	Abnormal temp. sensors or Current Transformer (*2)
—	◑	☼	☼	●	☼	Control box overheating (Not abnormal)
H34	◑	●	●	●	☼	Power transistor module overheating
F99	◑	●	●	☼	●	DC peak detection (*2)
F91	◑	●	●	☼	☼	Refrigerant cycle abnormality (*2)
F90	◑	☼	●	●	☼	Low voltage power supply to main circuit
F11	◑	☼	●	●	●	4-Way valve switching failure
F97	◑	☼	☼	☼	☼	Outdoor fan motor mechanism lock
—	☼	—	—	—	—	Note 1
—	●	—	—	—	—	Power supply fault or (*2)

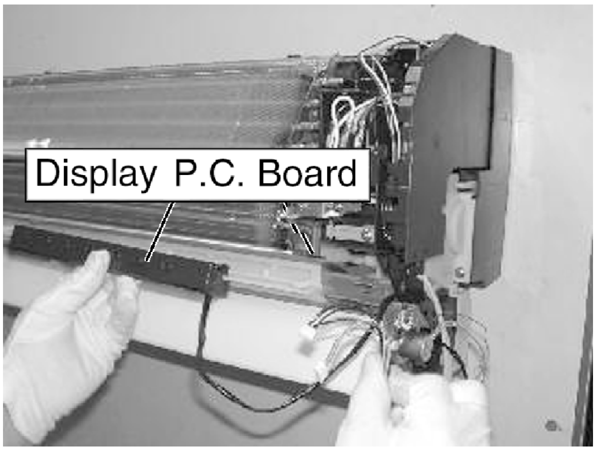
Notes 1. Turn the power off and then on again. If the LED-A(green) turn on, the outdoor unit pcb is faulty.
2. Diagnosis marked * does not apply to some cases.
For details, refer to the service manual.

13.3. DISASSEMBLY OF PARTS

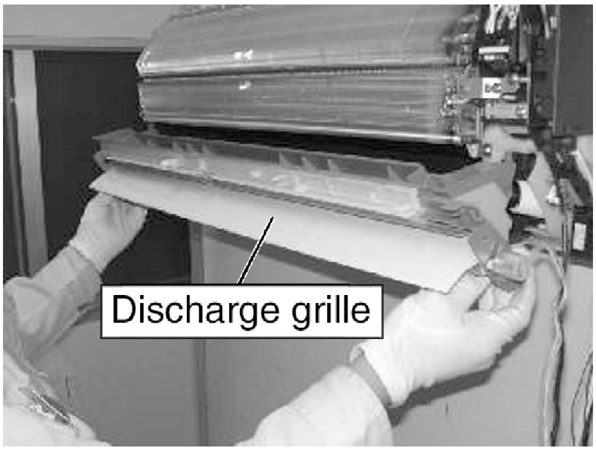
13.3.1. Indoor Unit


Control box cover

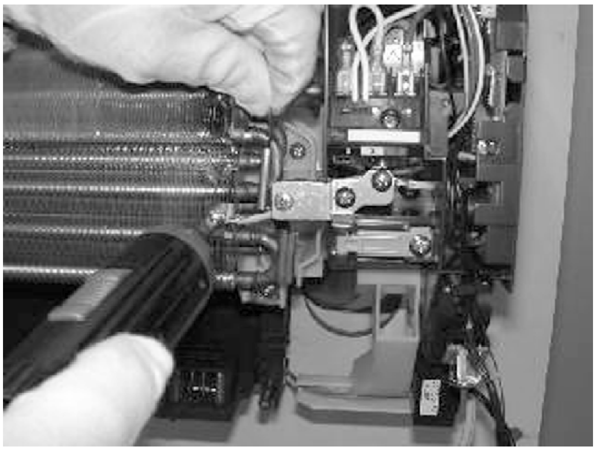
1. **Remove the control box cover (steel plate**


Display P.C. Board

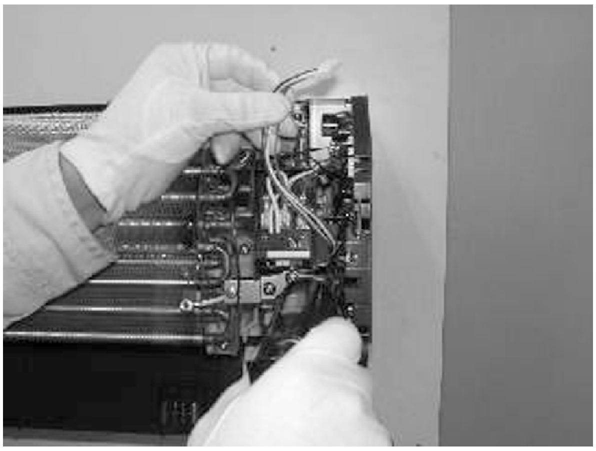
2. **Remove the display P.C. Board (plastic).**


Discharge grille

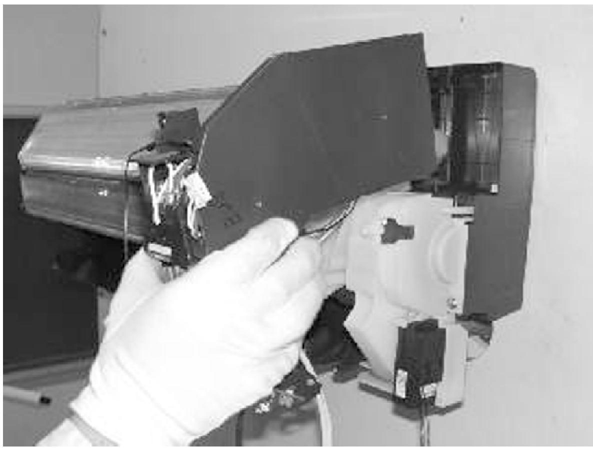
3. **Disconnect the connectors, rearrange the wires, and remove the discharge grille.**



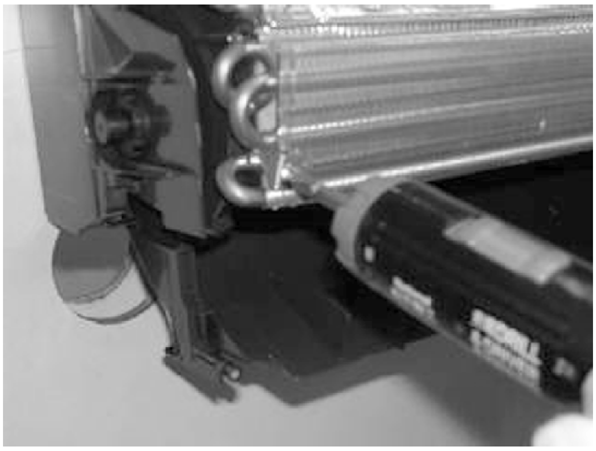
4. **Remove the ground screw.**



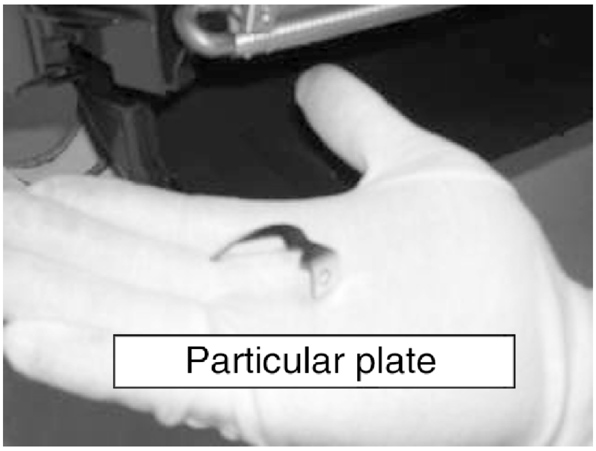
5. **Disconnect the connectors of the fan mot sensor, and others.**

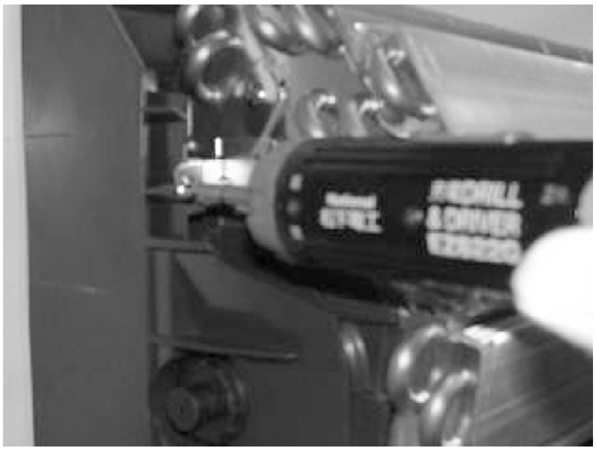


6. **Remove the control board complete.**

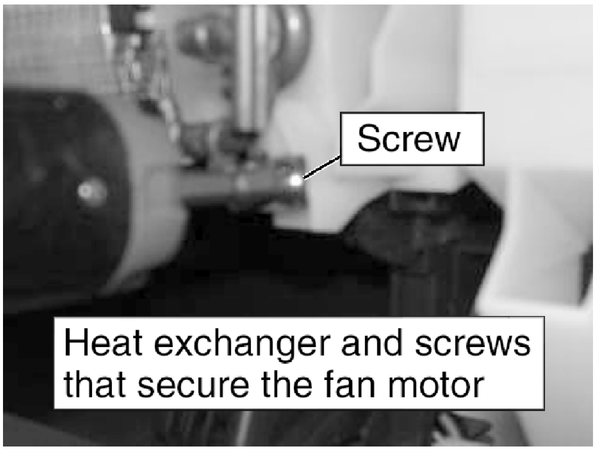


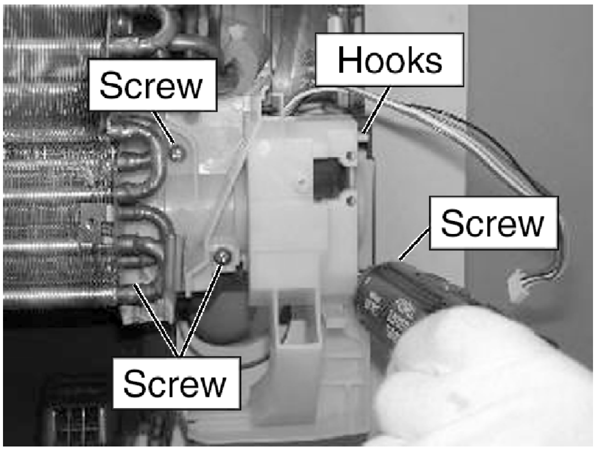
7. **Remove the screw at the particular plate exchanger clamp) on the left of the unit.**


Particular plate

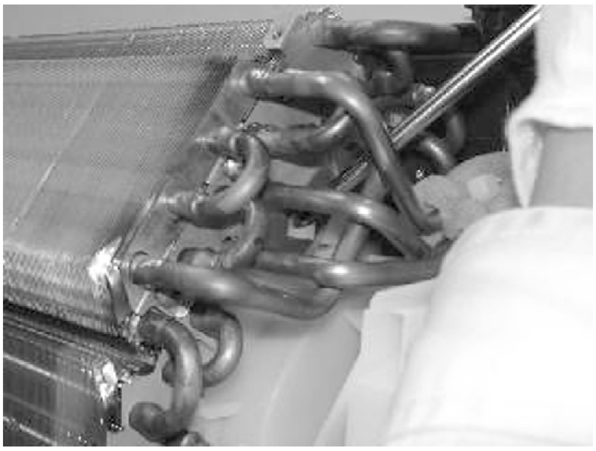


8. **Remove the screw that fix the heat excha the base pan.**

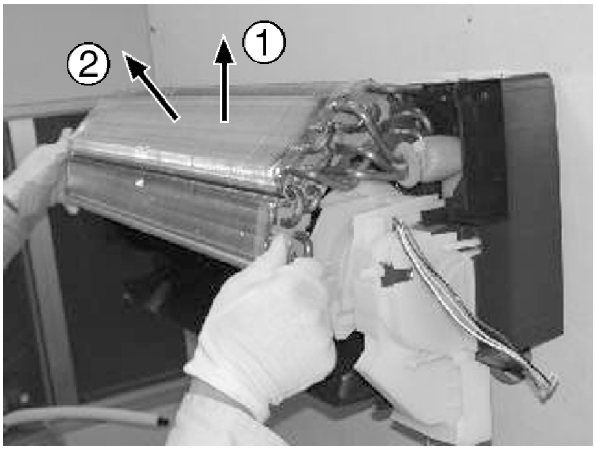

Screw
Heat exchanger and screws that secure the fan motor

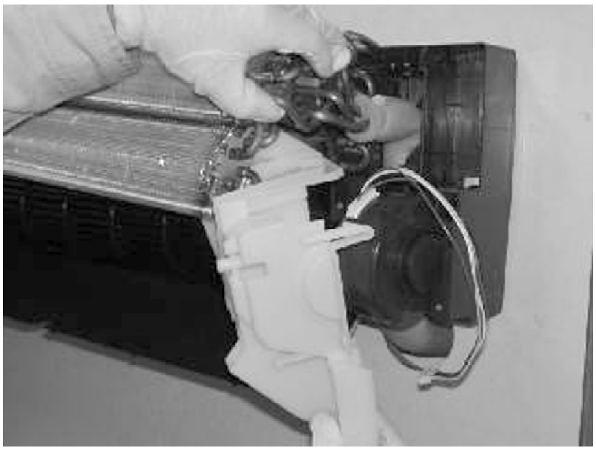

Screw
Hooks
Screw
Screw

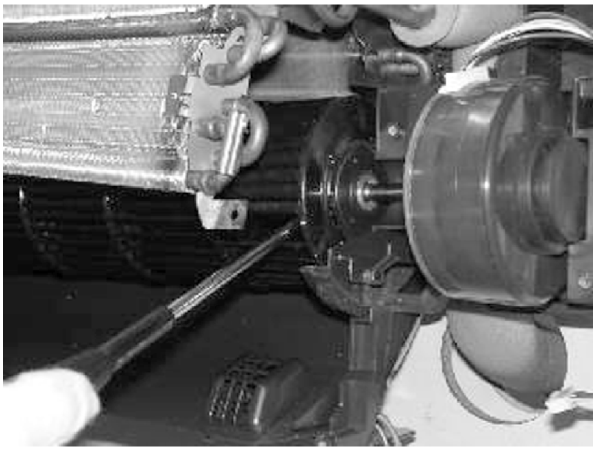
9. **Remove the four screws that fix the fan m cover (white), and release the hooks.**



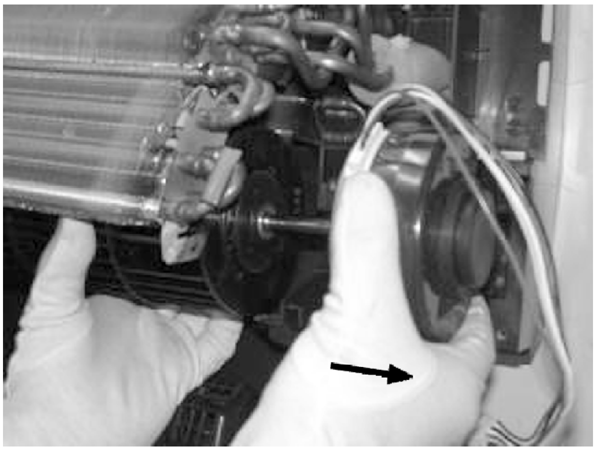
10. **Hold down the hook of the heat exchang screwdriver or other tool and remove the exchanger (while lifting 1, 2). Now remov motor cover.**

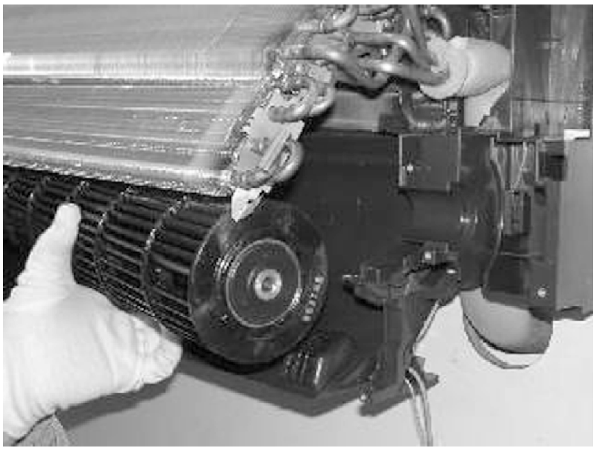


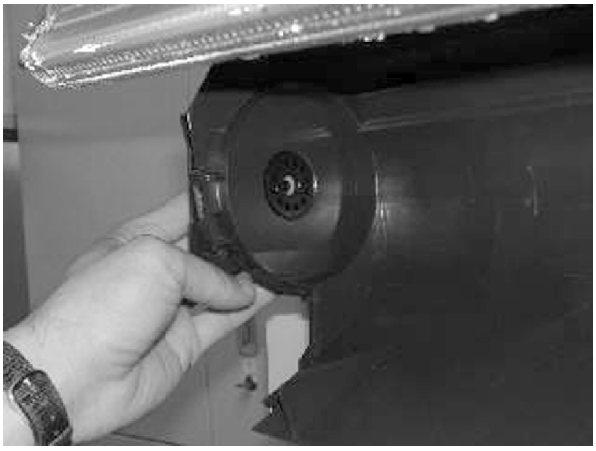


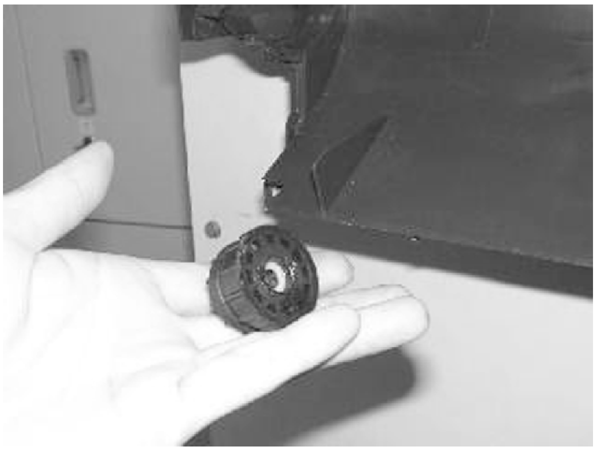


11. **Remove the screw that fix the fan, and th remove the fan motor.**





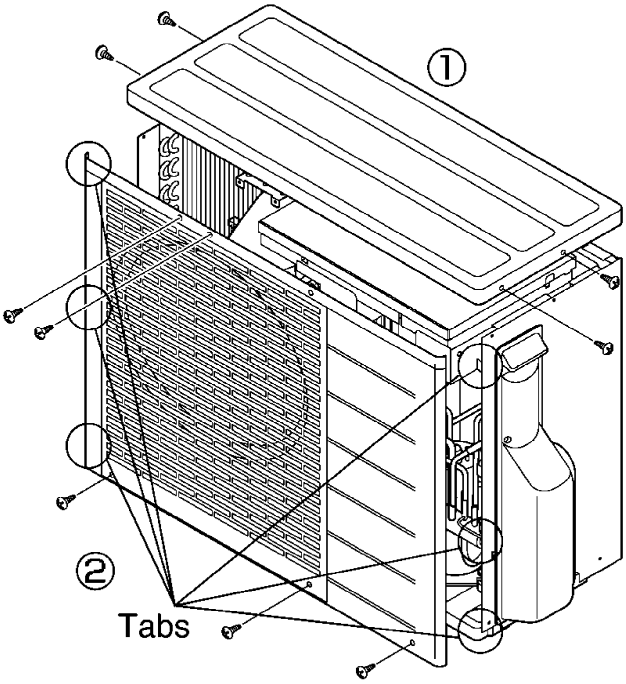




12. **Remove the cross-flow fan, and then rem flucrum.**

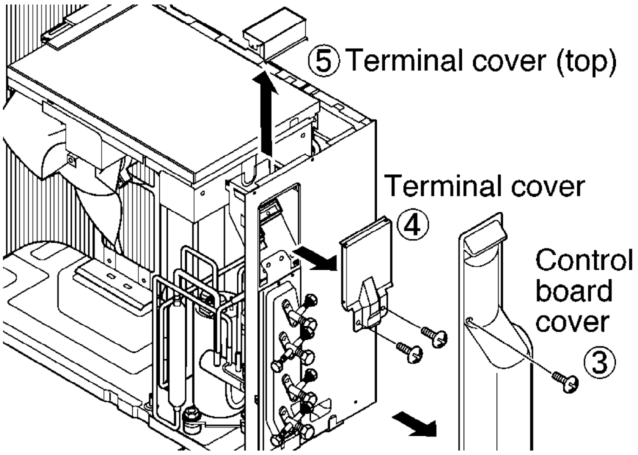
13.3.2. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)

13.3.2.1. Removing the Cabinet Top Plate and Cabinet Front Plate



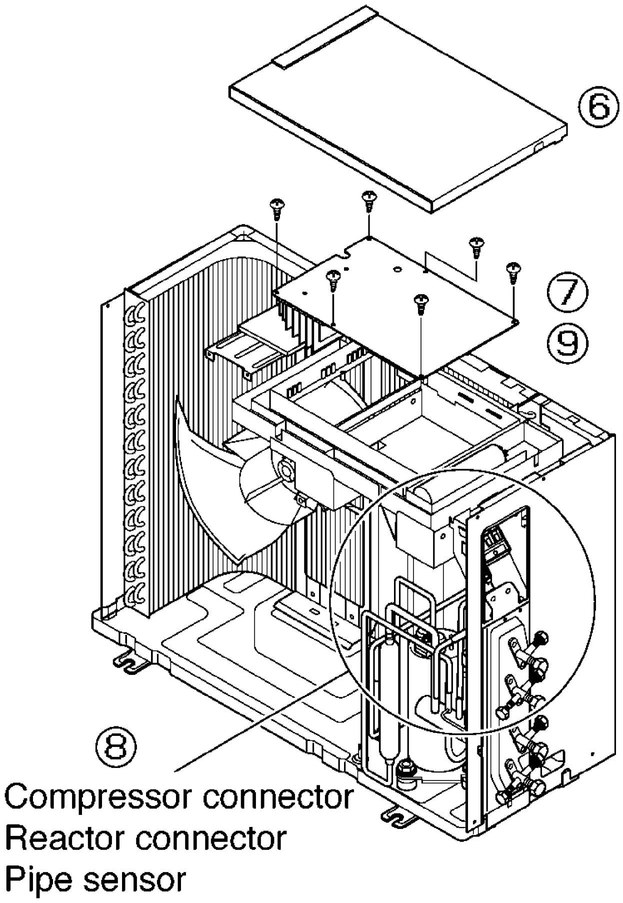
1. **Remove the cabinet top plate (by removi**
   screws).
2. **Remove the 5 screws fixing the cabinet f**
   release the 6 hooks, and pull the cabinet
   plate toward front side.

13.3.2.2. Removing the Control Board Cover


⑤ Terminal cover (top)
Terminal cover
④
Control board cover
③

3. **Remove the control board cover (remove**
4. **Remove the terminal cover (remove the 2**
5. **Remove the terminal cover (top), and dis**
   all the lead wires (3 fasten tab) inside.

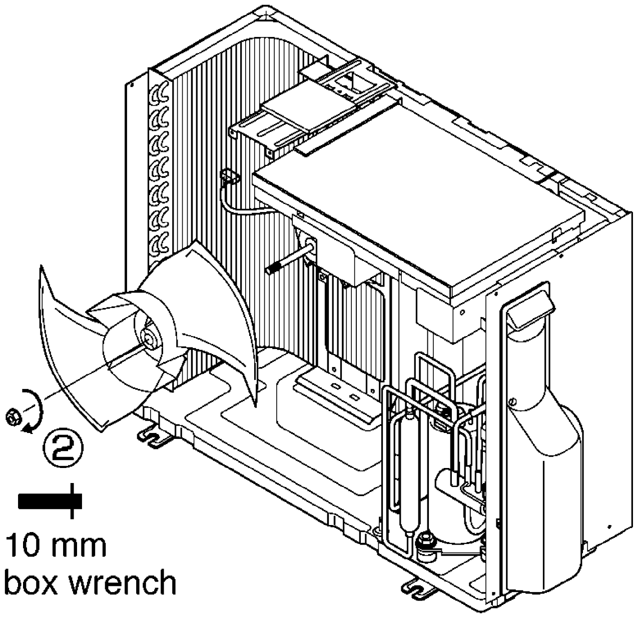
13.3.2.3. Removing the Control P.C. Board


⑥
⑦
⑨
⑧
Compressor connector
Reactor connector
Pipe sensor

6. **Remove the control board cover.**
7. **Remove the 6 screws at the positions on control P.C. Board indicated by the arrow**
8. **Disconnect the connectors and pipe sens connected to the compressor and reacto**
9. **Remove the control P.C. Board.**

* **When pulling the control P.C. Board upw may not be possible to remove it becaus way in which the ground wire and other routed. In this case, it is removed after th board cover itself has been removed.**

13.3.2.4. Removing the Propeller Fan and Fan Motor

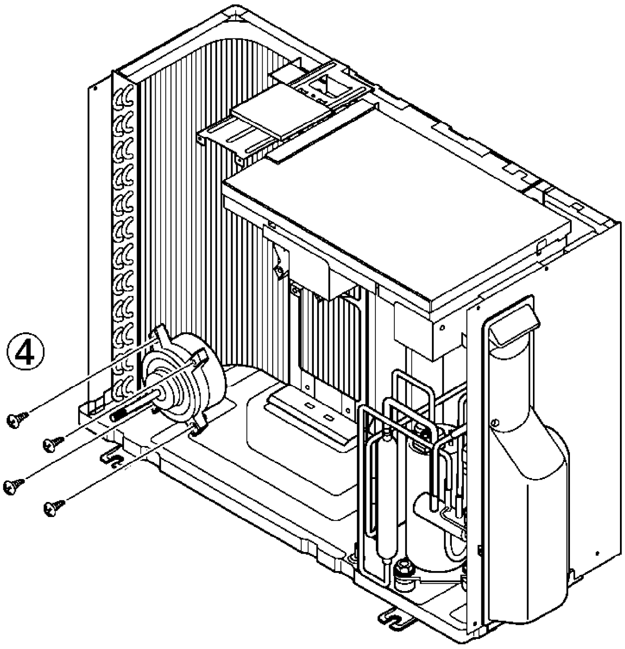


1. **Follow the steps in 13.3.2.1. for removing cabinet top plate and cabinet front plate.**

2. **Remove the propeller fan by removing th turning clockwise at its center.**

3. **Disconnect the connector of the fan mot the control P.C. Board.**

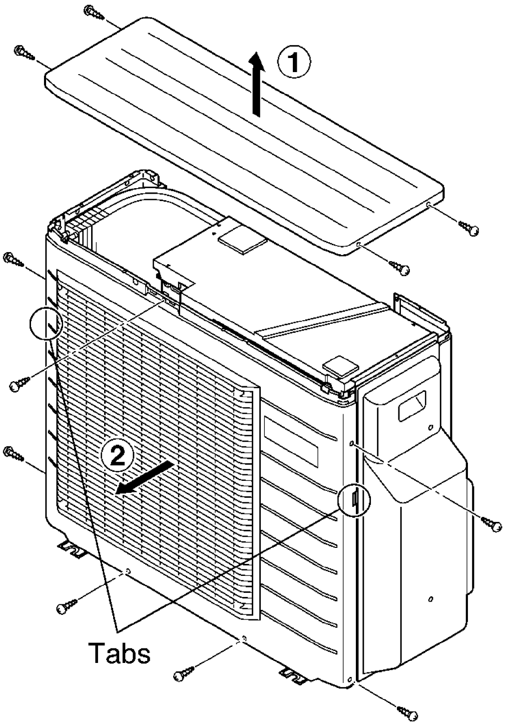
4. **Loosen the 4 fan motor mounting screws remove the fan motor.**



13.3.3. OUTDOOR UNIT (CU-3E23CBPG/CU-4E27CBPG)

13.3.3.1. Removing the Cabinet Top Plate and Cabinet Front Plate

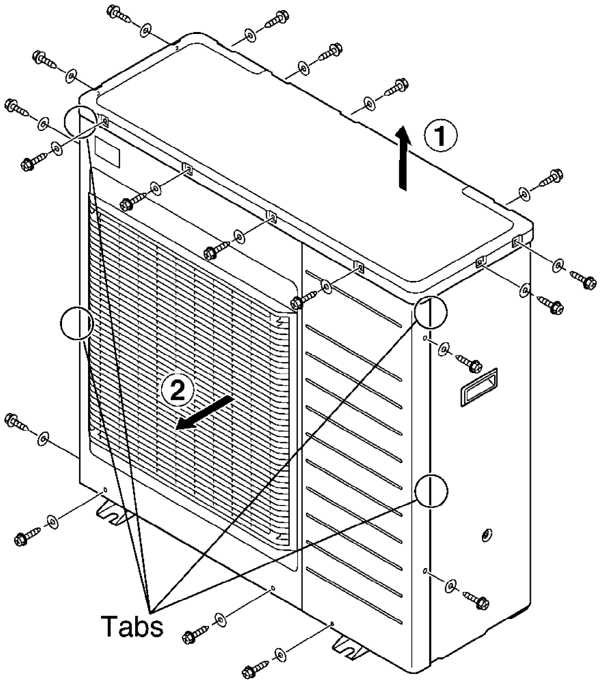
■ CU-3E23CBPG



1. **Remove the cabinet top plate (remove th screws).**

2. **Remove the 3 screws (1 on the right and bottom) securing the cabinet front plate, the 2 hooks (1 each at the left and right), the cabinet front plate toward front side.**

■ CU-4E27CBPG

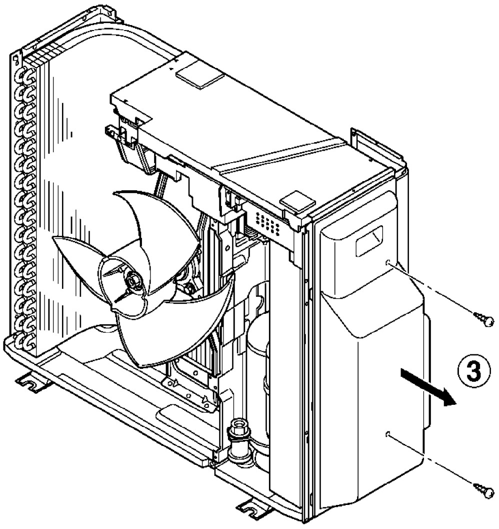


1. **Remove the cabinet top plate (remove th screws).**

2. **Remove the 7 screws (2 on the each side the bottom) fixing the cabinet front plate, the 4 hooks (2 each at the left and right), the cabinet front plate toward front side.**

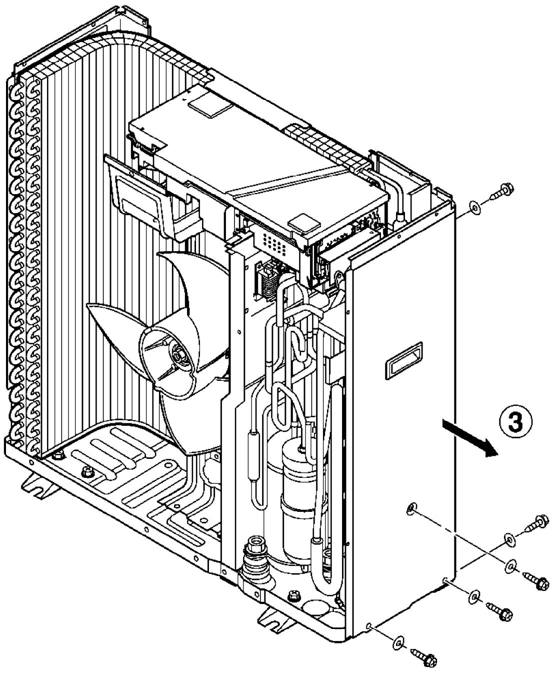
13.3.3.2. Remove the Control Board Cover (Right Side Plate for CU-4E27CBPG)

■ **CU-3E23CBPG**



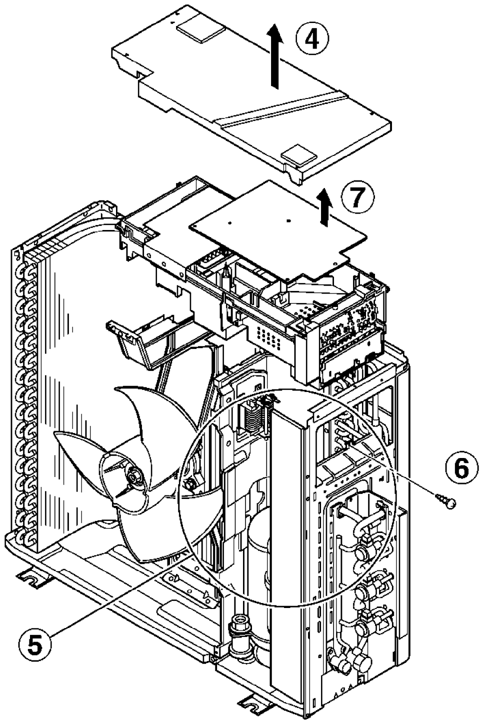
3. **Remove the control board cover (remove**

■ **CU-4E27CBPG**



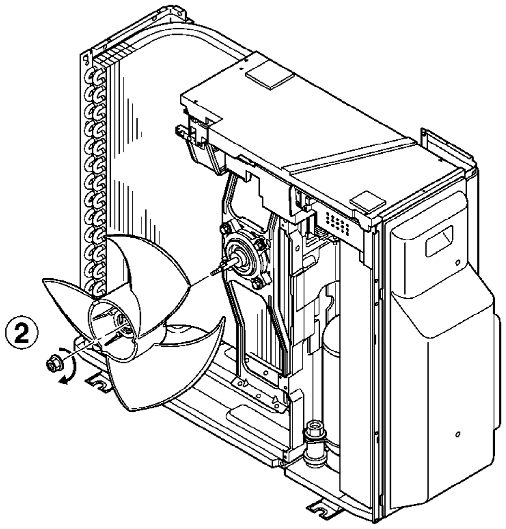
3. **Remove the 5 screws and release the 2 h the right side plate, and remove the side**

13.3.3.3. Removing the Control P.C. Board

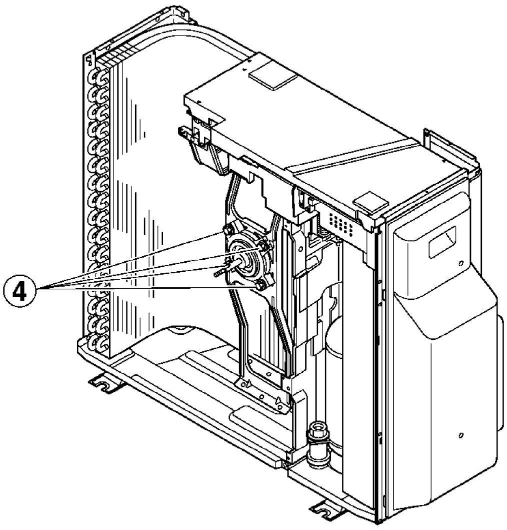


4. **Remove the drip proof cover.**
5. **Disconnect the connectors (lead wires of compressor, sensor, and others).**
6. **Remove the screw at the right side of the box, and pull out the entire control box.**
7. **Release the control P.C. Board tab to rem control P.C. Board.**

13.3.3.4. Removing the Propeller Fan and Fan Motor



1. **Follow the steps in 13.3.2.1. for removing cabinet top plate and cabinet front plate.**
2. **Remove the propeller fan by removing th turning clockwise at its center.**



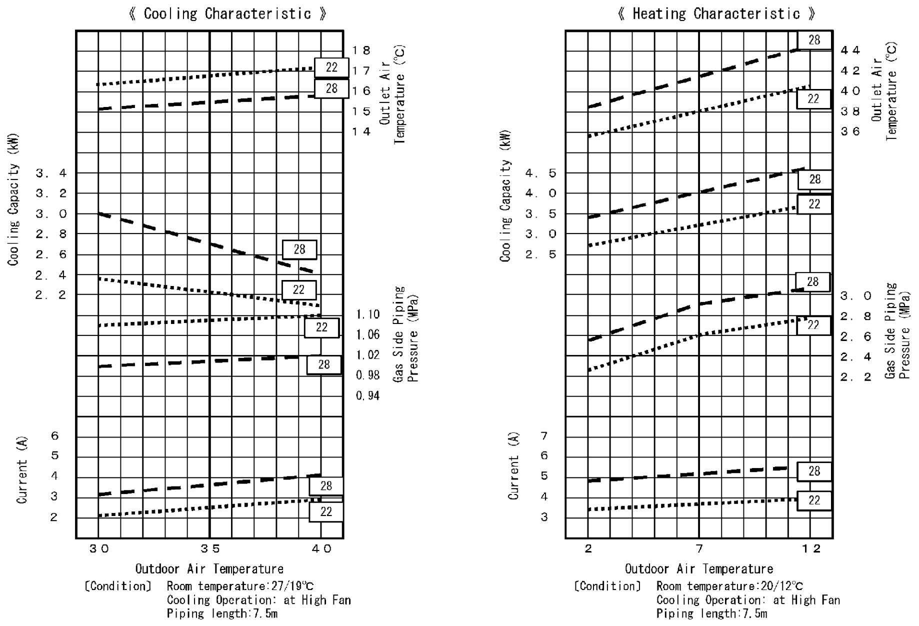
3. **Disconnect the fan motor connector from control P.C. Board.**

4. **Loosen the 4 fan motor mounting screws remove the fan motor.**

14. Technical Data

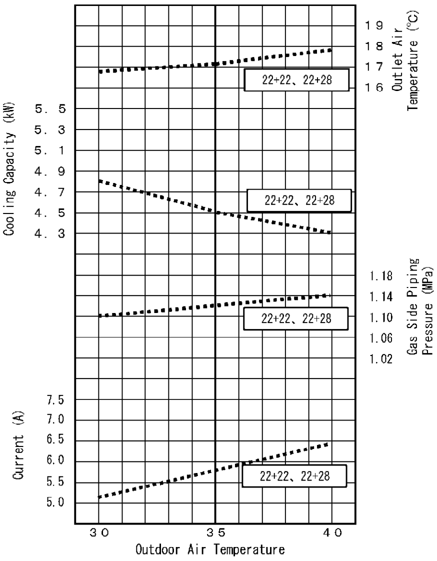
14.1. OPERATION CHARACTERISTICS

CU-2E15CBPG (One Indoor Unit Operation)



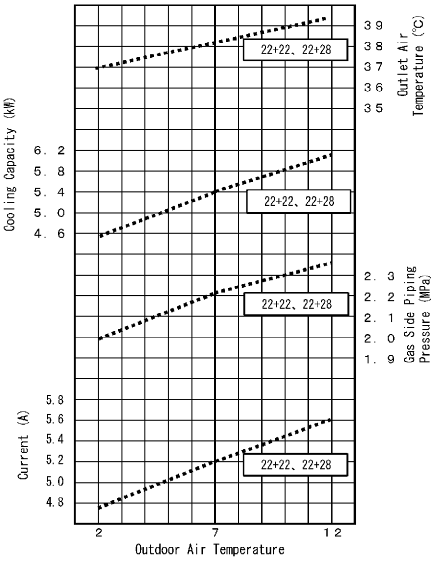
CU-2E15CBPG (Two Indoor Unit Operation)

《 Cooling Characteristic 》



[Condition] Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

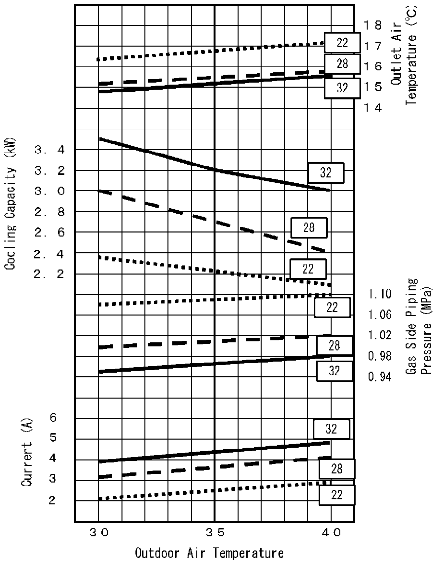
《 Heating Characteristic 》



[Condition] Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

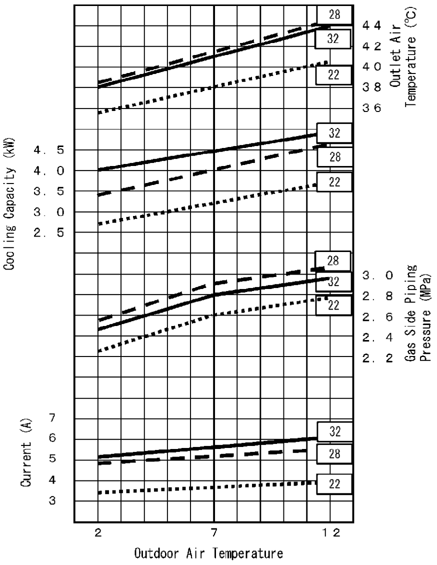
CU-2E18CBPG (One Indoor Unit Operation)

《 Cooling Characteristic 》



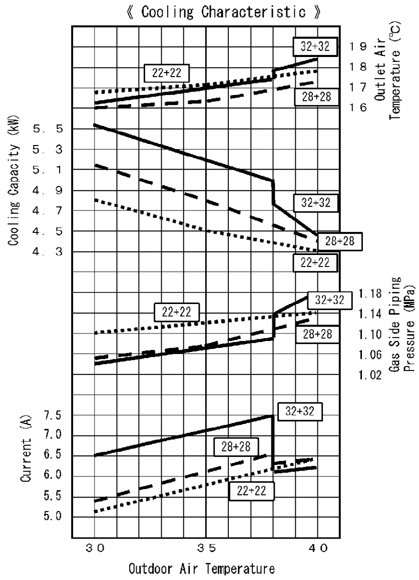
[Condition] Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

《 Heating Characteristic 》



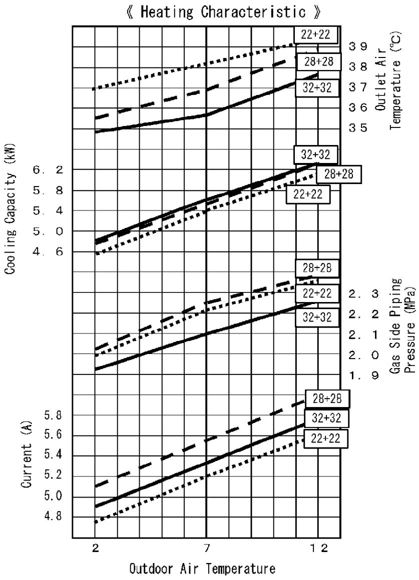
[Condition] Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

CU-2E18CBPG (Two Indoor Unit Operation)



《 Cooling Characteristic 》

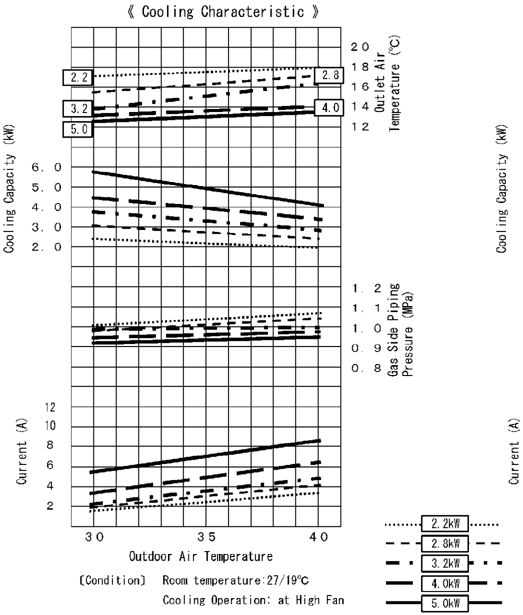
〔Condition〕 Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m



《 Heating Characteristic 》

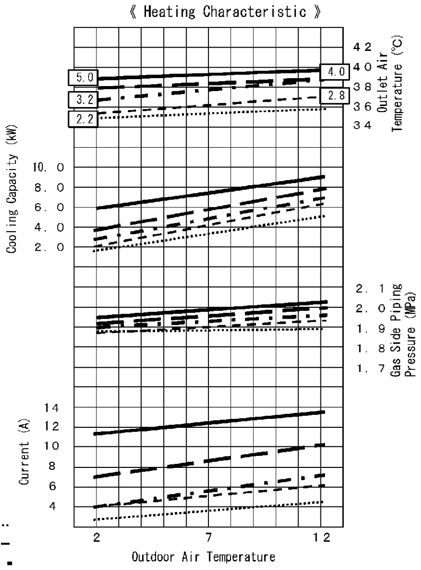
〔Condition〕 Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

CU-3E23CBPG (One Indoor Unit Operation)



《 Cooling Characteristic 》

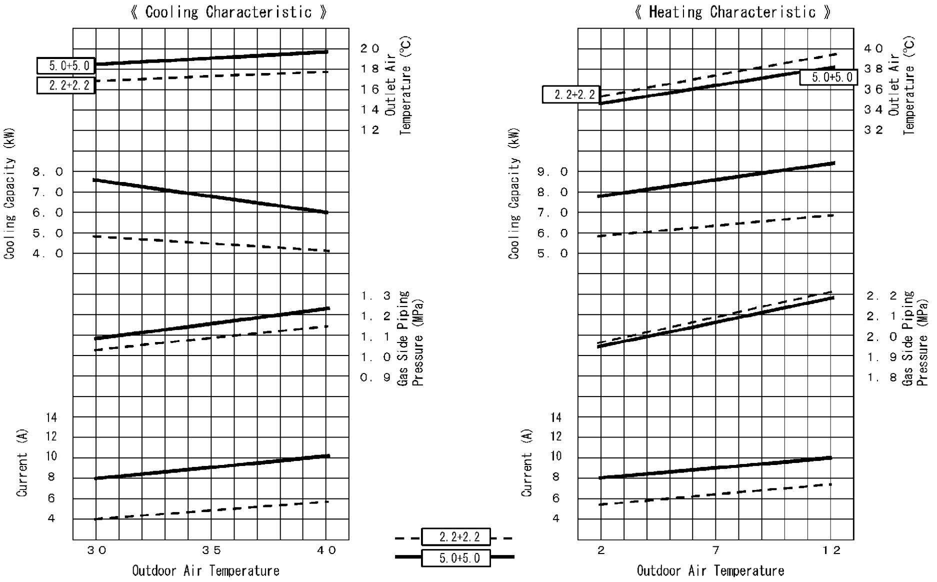
〔Condition〕 Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m



《 Heating Characteristic 》

〔Condition〕 Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

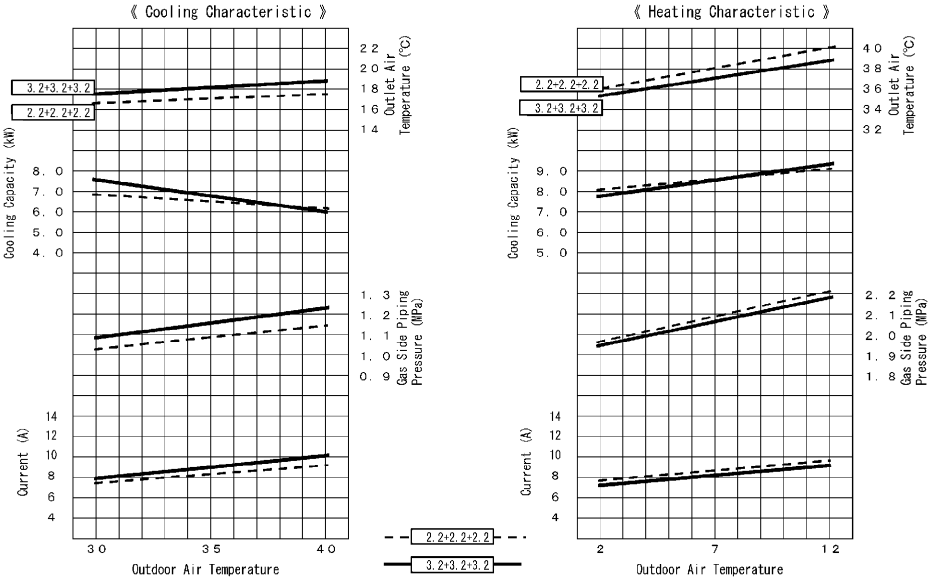
CU-3E23CBPG (Two Indoor Unit Operation)



〔Condition〕 Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

〔Condition〕 Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

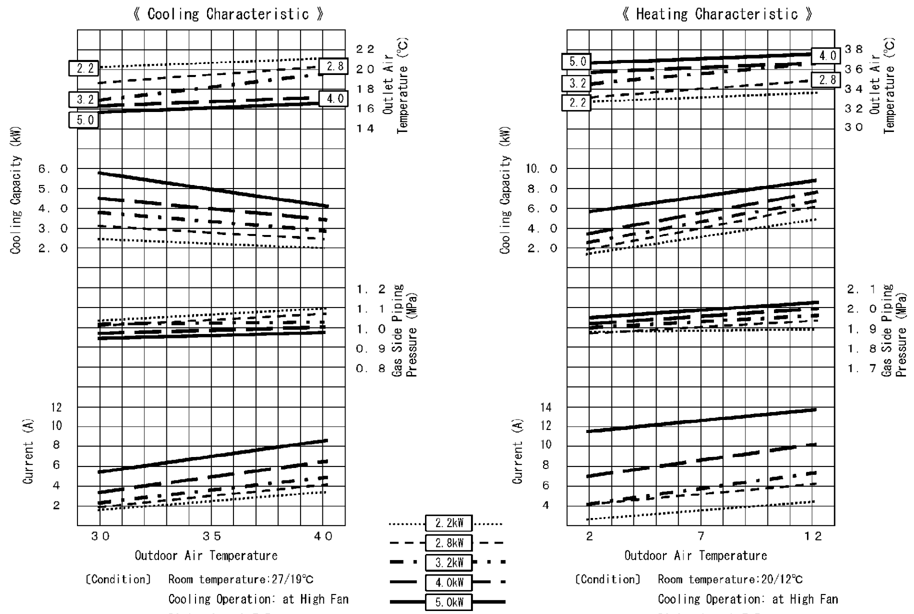
CU-3E23CBPG (Three Indoor Units Operation)



〔Condition〕 Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

〔Condition〕 Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

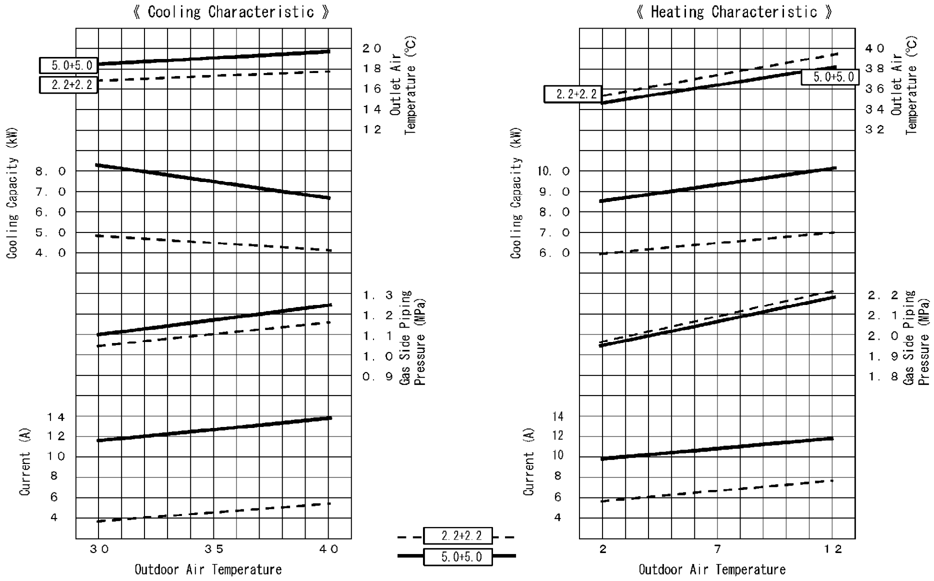
CU-4E27CBPG (One Indoor Unit Operation)



〔Condition〕 Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

〔Condition〕 Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

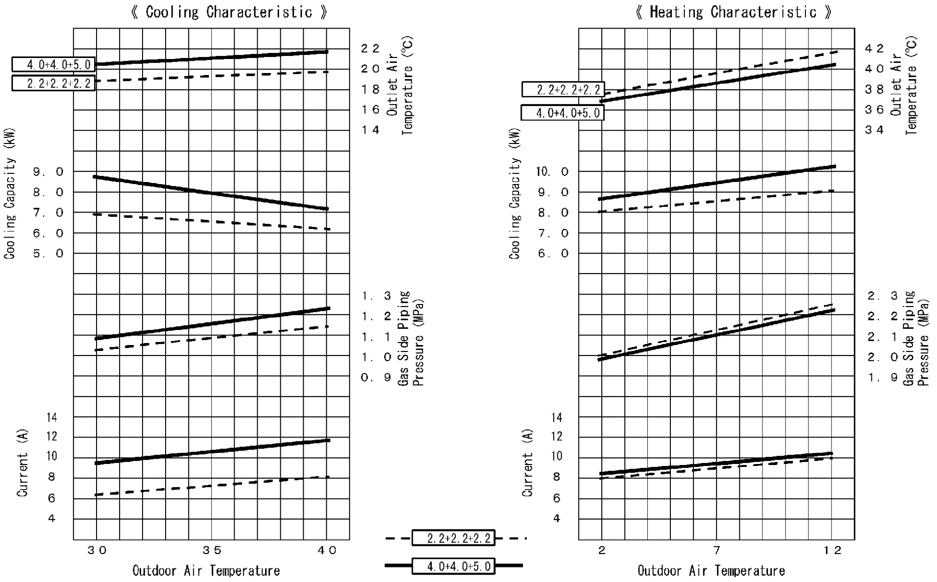
CU-4E27CBPG (Two Indoor Units Opertion)



〔Condition〕 Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

〔Condition〕 Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

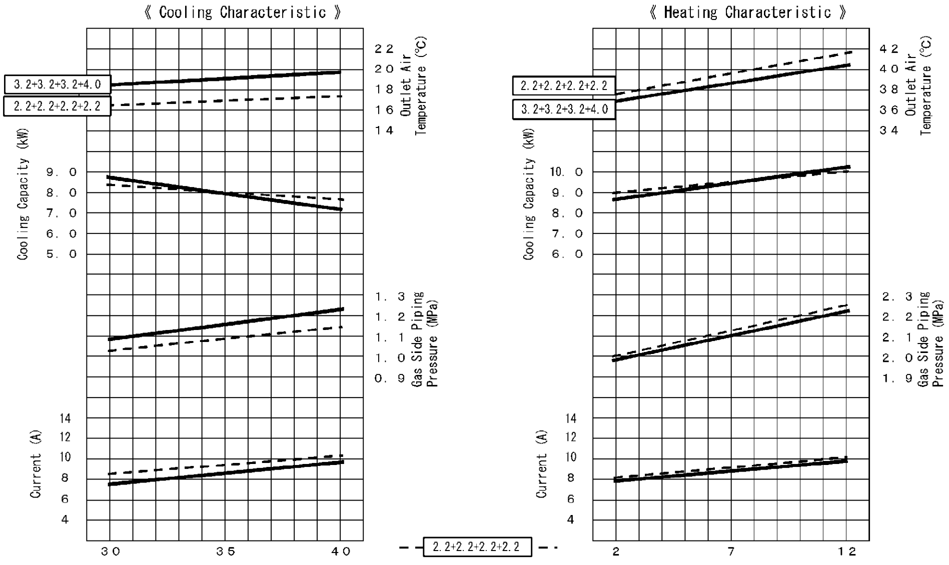
CU-4E27CBPG (Three Indoor Units Operation)



[Condition] Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

[Condition] Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

CU-4E27CBPG (Four Indoor Units Opertion)



[Condition] Room temperature:27/19℃
Cooling Operation: at High Fan
Piping length:7.5m

[Condition] Room temperature:20/12℃
Cooling Operation: at High Fan
Piping length:7.5m

15. Electronic Circuit Diagram

15.1. REMOTE CONTROL

15.2. INDOOR UNIT

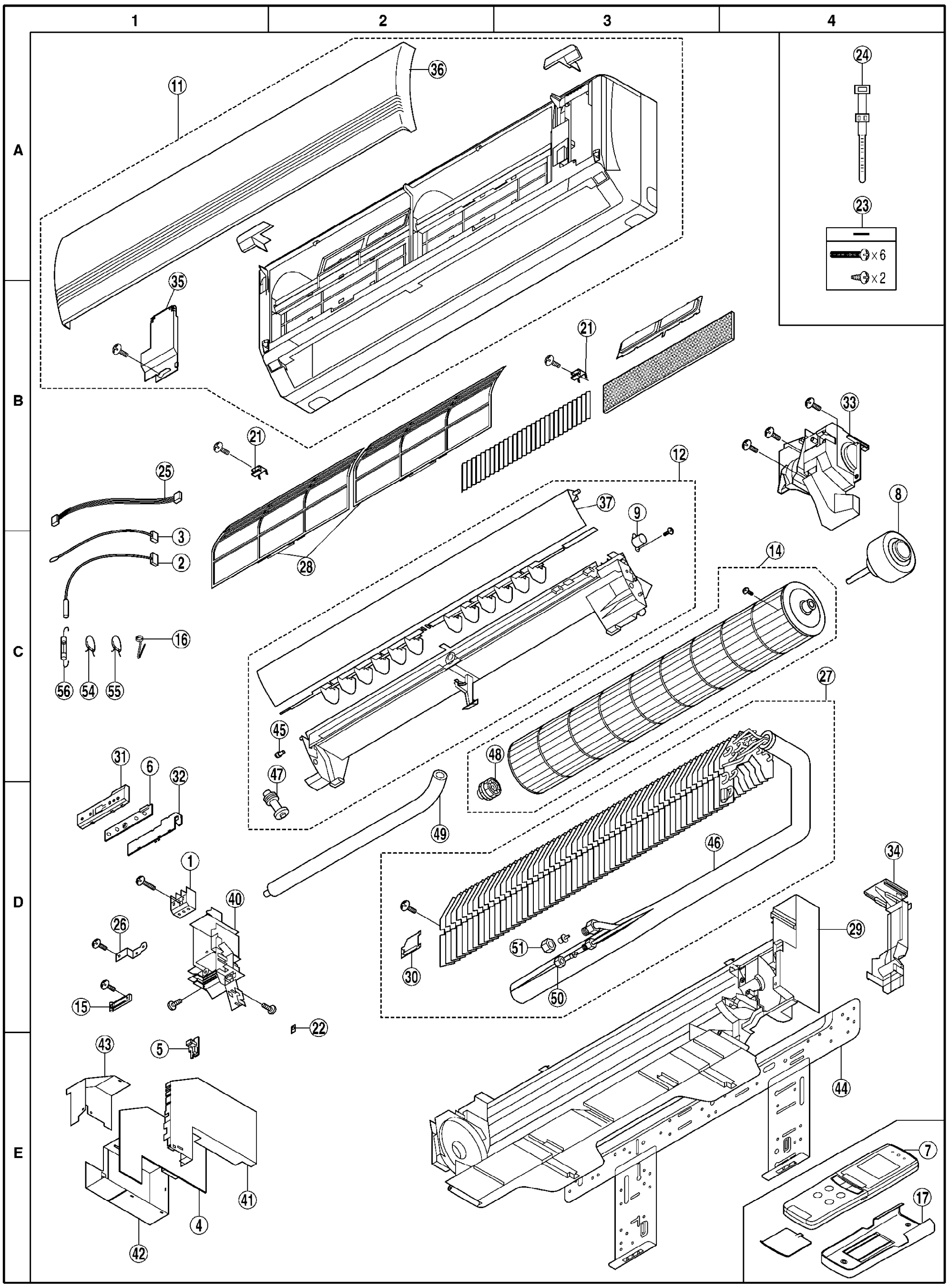
15.3. OUTDOOR UNIT (CU-2E15CBPG/2E18CBPG)

15.4. OUTDOOR UNIT (CU-3E23CBPG/CU-4E27CBPG)

16. Exploded View & Replacement Parts List

16.1. CS-ME7CKPG/ME10CKPG/ME12CKPG/ME14CKPG/ME18CKPG

16.1.1. Exploded View


1
2
3
4
A
B
C
D
E
36
11
24
23
x6
x2
35
21
21
33
25
12
37
9
8
3
2
28
14
16
56
54
55
27
45
48
47
31
6
32
49
46
34
1
40
26
29
51
30
50
15
22
43
5
44
7
17
41
4
42

Note:

The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

16.1.2. Replacement Parts List

<Model: CS-ME7CKPG / CS-ME10CKPG / CS-ME12CKPG / CS-ME14CKPG / CS-ME18CKPG>

Ref. No.	Part Name & Description	Q'ty	Part No.					R
			CS-ME7CKPG	CS-ME10CKPG	CS-ME12CKPG	CS-ME14CKPG	CS-ME18CKPG	
1	TERMINAL BOARD COMPLETE	1	CWA28K1045	←	←	←	←	
2	SENSOR COMPLETE (PIPE)	1	CWA50C2101	←	←	←	←	
3	SENSOR COMPLETE (INTAKE)	1	CWA50C2103	←	←	←	←	
4	PC BOARD (MAIN)	1	CWA73C1332	CWA73C1333	CWA73C1334	CWA73C1335	CWA73C1336	
5	PC BOARD (RECEIVER)	1	CWA742895	←	←	←	←	
6	PC BOARD (DISPLAY)	1	CWA742894	←	←	←	←	
7	REMOTE CONTROL CONPLETE	1	CWA75C2311	←	←	←	←	
8	FAN MOTOR	1	CWA981056	←	←	←	CWA981073	
9	MOTOR-AIR SWING	1	CWA98259X	←	←	←	←	
11	FRONT GRILLE COMPLETE	1	CWE11C2681	←	←	←	←	
12	DISCHARGE GRILLE COMPLETE	1	CWE20C2174	←	←	←	←	
14	CROSS-FLOW FAN COMPLETE	1	CWH02K1016	←	←	←	←	
15	HOLDER CORD	1	CWH31103	←	←	←	←	
16	HOLDER SENSOR	1	CWH32137	←	←	←	←	
17	HOLDER REMOTE CONTROL	1	CWH361008	←	←	←	←	
21	CAP(FRONT GRILLE)	2	CWH521025B	←	←	←	←	
22	NUT	1	CWH56081	←	←	←	←	
23	SCREW SET	1	CWH82C1155	←	←	←	←	
24	BELT	1	CWH881003	←	←	←	←	
25	LEAD WIRE COMPLETE(AIR SWING)	1	CWMA60C0001	←	←	←	←	
26	TERMINAL PLATE FOR EARTH	1	CWMA64C0001	←	←	←	←	
27	EVAPORATOR	1	CWMB30C0020	←	CWMB30C0019	←	←	
28	AIR FILTER	2	CWMD000001	←	←	←	←	
29	CHASSIS COMPLETE	1	CWMD50C0014	←	←	←	←	
30	PARTICULAR PLATE (EVA)	1	CWMD910002	←	←	←	←	
31	PARTICULAR PLATE (DISPLAY)	1	CWMD930001	←	←	←	←	
32	PARTICULAR PLATE (DISPLAY)	1	CWMD930002	←	←	←	←	
33	PARTICULAR COVER (FAN MOTOR)	1	CWMD930003	←	←	←	←	
34	PARTICULAR COVER (PIPE)	1	CWMD930009	←	←	←	←	
35	GRILLE DOOR	1	CWME140001	←	←	←	←	
36	INTAKE GRILLE	1	CWE22K1161	←	←	←	←	
37	LOUVER	1	CWME240001	←	←	←	←	
40	CONTROL BOARD BOX	1	CWH102172	←	←	←	←	
41	CONTROL COVER-1	1	CWMH130001	←	←	←	←	
42	CONTROL COVER-2	1	CWMH130002	←	←	←	←	
43	CONTROL COVER-3	1	CWMH130003	←	←	←	←	
44	INSTALLATION PLATE	1	CWMH36K0002	←	←	←	←	
45	SHAFT FOR LOUVER	1	CWMH630001	←	←	←	←	
46	TUBE ASSY	1	CWMT00C0015	←	CWMT00C0005	←	←	
47	DRAIN CAP	1	CWRH520001	←	←	←	←	

Ref. No.	Part Name & Description	Q'ty	Part No.					R
			CS-ME7CKPG	CS-ME10CKPG	CS-ME12CKPG	CS-ME14CKPG	CS-ME18CKPG	
48	FLUCRUM	1	CWRH64K0001	←	←	←	←	
49	DRAIN HOSE	1	CWRH850001	←	←	←	←	
50	FLARE NUT (1/4)	1	CWT25086	←	←	←	←	
51	FLARE NUT (3/8)	1	CWT25087	←	←	←	←	
54	ZNR	1	ERZVEAV201	←	←	←	←	
55	ZNR	1	ERZVEAV511	←	←	←	←	
56	FUSE (250V, 3A)	1	K5E312BB0002	←	←	←	←	

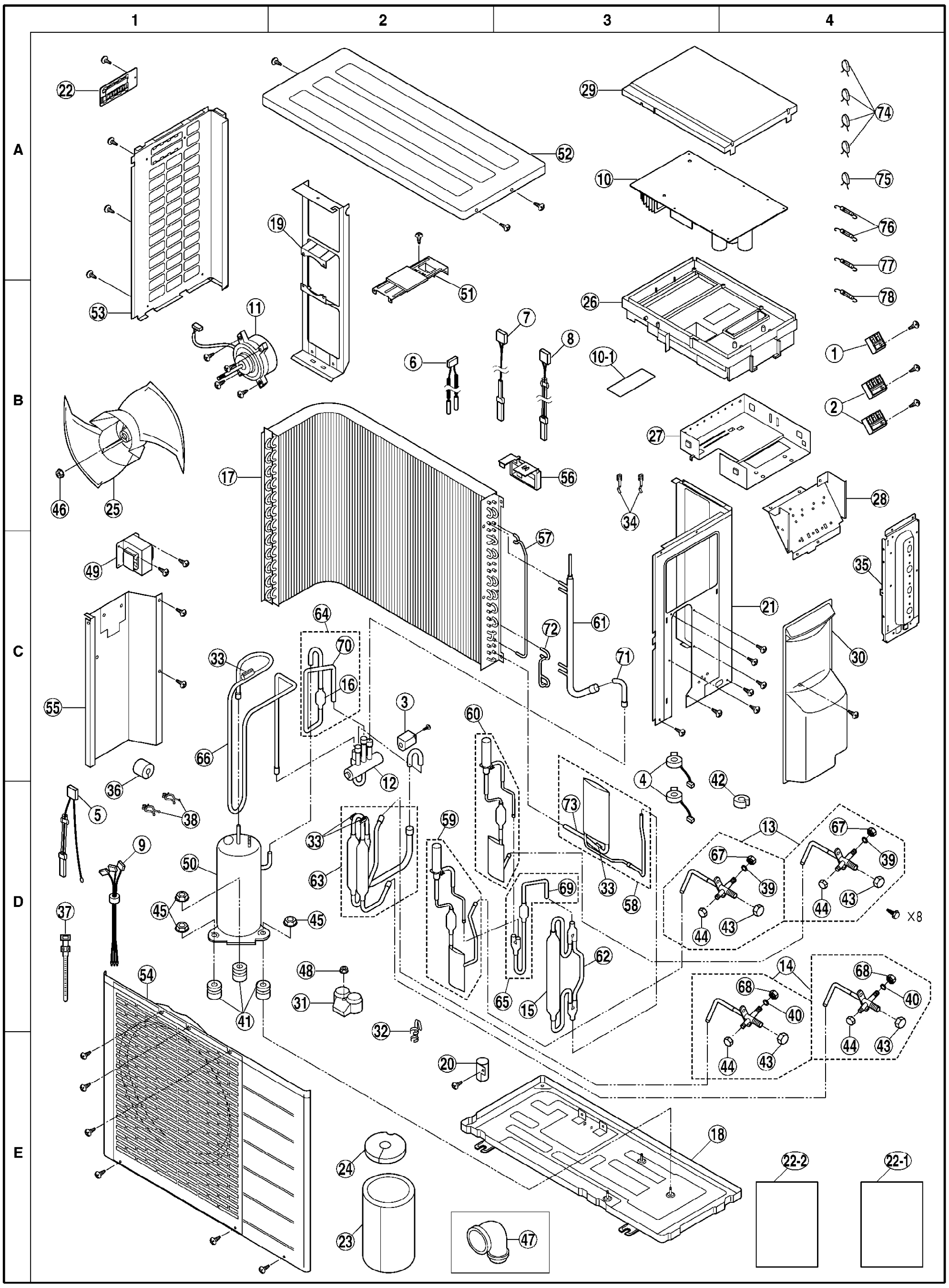
(Note)

- " ● " marked parts are recommended to be kept in stock.

- All parts are supplied from ACD, JAPAN (VENDER CODE : 00025800).

16.2. CU-2E15CBPG/2E18CBPG

16.2.1. Exploded View


1
2
3
4
A
B
C
D
E
22
29
74
52
10
75
19
76
77
78
53
11
51
26
7
8
10-1
1
6
2
27
17
56
46
25
34
28
57
49
35
64
72
61
21
70
30
33
16
71
55
3
60
66
12
4
42
36
5
38
73
13
67
59
39
9
33
50
63
69
33
58
67
39
44
43
X8
45
45
37
44
43
62
54
48
14
68
40
31
68
41
40
65
15
32
44
43
44
43
20
18
24
22-2
22-1
23
47

Note:
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

16.2.2. Replacement Parts List

<Model: CU-2E15CBPG / CU-2E18CBPG>

Ref. No.	Part Name & Description	Q'ty	Part No.		Remarks
			CU-2E15CBPG	CU-2E18CBPG	
1	TERMINAL BOARD COMPLETE (3P)	1	CWA28K1045	←	●
2	TERMINAL BOARD COMPLETE (4P)	2	CWA28K1046	←	●
3	VALVE COIL	1	CWA43C2112	CWA43C2086	●
4	EXPANSION VALVE COIL	2	CWA43C2086	←	●
5	THERMISTOR(OUTDOOR, COND TEMP)	1	CWA50C2088	←	●
6	THERMISTOR(PIPE A.B TEMP)	1	CWA50C2089	←	●
7	THERMISTOR(DISCHARGE TEMP)	1	CWA50C2090	←	●
8	THERMISTOR(COND EXIT TEMP)	1	CWA50C2097	←	●
9	LEAD WIRE COMPLETE (COMP)	1	CWA67C3790	←	
10	PC BOARD (MAIN)	1	CWA73C1353	CWA73C1354	●
10-1	PC BOARD (POWER)	1	CWA742957	←	●
11	FAN MOTOR	1	CWA981072	←	●
12	4-WAY VALVE	1	CWB001017	←	●
13	3-WAY VALVE (1/4)	2	CWB011080	←	●
14	3-WAY VALVE (3/8)	2	CWB011081	←	●
15	DRYER	1	CWB101011	←	●
16	STRAINER	1	CWB111004	←	
17	CONDENSER	1	CWB32C1160	←	
18	CHASSIS COMPLETE	1	CWD50K2058	←	
19	FAN MOTOR BRACKET	1	CWD541021	←	
20	HOLDER	1	CWD791001	←	
21	CABINET SIDE PLATE	1	CWE04C1015	←	
22	HANDLE	1	CWE161001	←	
22-1	OPERATION INSTARUCTIONS	1	CWF563678	←	
22-2	INSTALLATION INSTARUCTIONS	1	CWF612315	←	
23	SOUND PLOOF MATERIAL	1	CWG302138	←	
24	SOUND PLOOF MATERIAL	1	CWG302139	←	
25	PROPELLER FAN	1	CWH03K1005	←	
26	CONTROL BOARD-1	1	CWH102135	←	
27	CONTROL BOARD-2	1	CWH102136	←	
28	CONTROL BOARD-3	1	CWH102164	←	
29	CONTROL BOARD COVER-1	1	CWH131116	←	
30	CONTROL BOARD COVER-2	1	CWH13C1073	←	
31	TERMINAL COVER	1	CWH17006	←	
32	HOLDER-SENSOR-1	1	CWH32074	←	
33	HOLDER-SENSOR-2	4	CWH32075	←	
34	HOLDER-SENSOR-3	2	CWH32138	←	
35	HOLDER-COUPLING	1	CWH351018	←	
36	ANTI-VABRATION BUSHING	1	CWH4601085	←	
37	BELT-1	1	CWH4605004	←	
38	BELT-2	2	CWH4605010	←	
39	CAP-1	2	CWH4611109	←	
40	CAP-2	2	CWH4611110	←	
41	ANTI-VIBRATION BUSHING (COMP)	3	CWH501022	←	

Ref. No.	Part Name & Description	Q'ty	Part No.		Remarks
			CU-2E15CBPG	CU-2E18CBPG	
42	BUSHING	1	CWH511039	←	
43	CAP-3	4	CWH521027	←	
44	CAP-4	4	CWH52273	←	
45	NUT (COMP)	3	CWH56000	←	
46	NUT (CROSS-FLOW FAN)	1	CWH56053	←	
47	DRAIN ELBOW	1	CWH5850080K	←	
48	NUT (TARMINAL)	1	CWH7080300	←	
49	REACTOR	1	CWA421051	←	
50	COMPRESSER	1	CWMB090001	←	●
51	PARTICULAR PIECE	1	CWMD910006X	←	
52	CABINET TOP PLATE	1	CWME03C0001	←	
53	CABINET SIDE PLATE	1	CWE041054	←	
54	CABINET FRONT PLATE	1	CWE06C1046	←	
55	SOUND PLOOF PLATE	1	CWH151032	←	
56	HOLDER SENSOR-4	1	CWMH320001	←	
57	TUBE ASSY-1	1	CWT022719	←	
58	TUBE ASSY COMPLETE (CAPILLARY)	1	CWT01C2528	←	
59	TUBE ASSY COMPLETE (EXPANSION VALVE)	1	CWT01C2499	←	
60	TUBE ASSY COMPLETE (EXPANSION VALVE)	1	CWT01C2500	←	
61	TUBE ASSY-2	1	CWT022734	←	
62	TUBE ASSY-3	1	CWT022510	←	
63	TUBE ASSY-4	1	CWT022511	←	
64	TUBE ASSY-5	1	CWT022515	←	
65	TUBE ASSY-6	1	CWT022516	←	
66	TUBE ASSY-7	1	CWT022647	←	
67	FLARE NUT (1/4)	2	CWT25086	←	
68	FLARE NUT (3/8)	2	CWT25087	←	
69	MULTI BEND TUBE-1	1	CWT332957	←	
70	MULTI BEND TUBE-2	1	CWT332958	←	
71	MULTI BEND TUBE-3	1	CWT333298	←	
72	TUBE ASSY-8	1	CWT022720	←	
73	MULTI BEND TUBE-4	1	CWT022735	←	
74	ZNR	4	ERZVEAV511	←	
75	ZNR	1	ERZV10D182	←	
76	FUSE (250V, 3.15A)	2	XBA2C31TRO	←	
77	FUSE (250V, 5A)	1	XBA2C50TRO	←	
78	FUSE (20A)	1	K5D203BBA002	←	

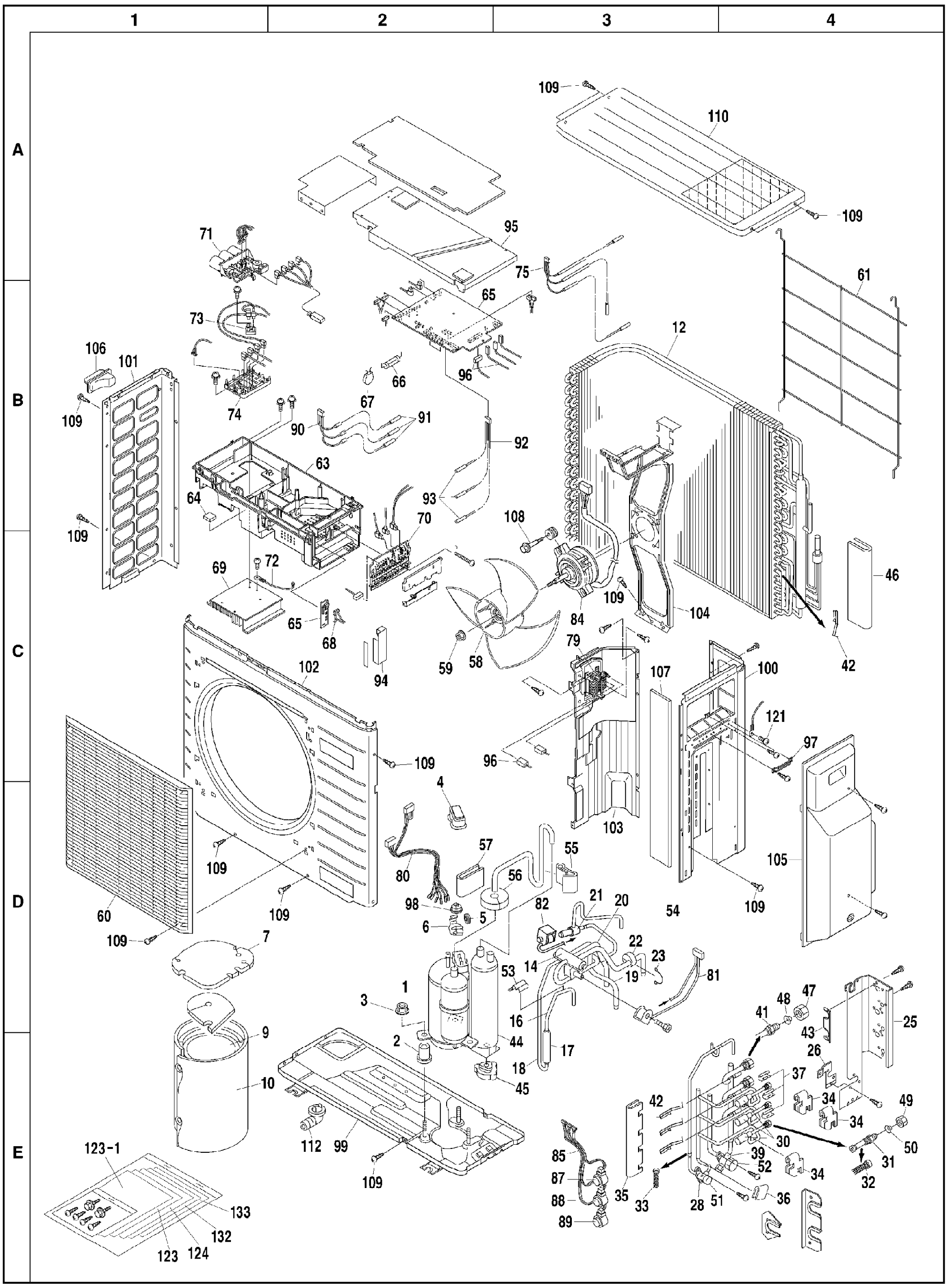
(Note)

- " ● " marked parts are recommended to be kept in stock.

- All parts are supplied from ACD, JAPAN (VENDER CODE: 00025800).

16.3. CU-3E23CBPG

16.3.1. Exploded View


1
2
3
4
A
B
C
D
E
109
110
109
95
71
75
61
65
73
12
106
101
96
66
109
74
67
91
90
92
63
64
93
70
108
109
46
69
72
84
109
104
65
68
79
59
58
94
102
107
100
42
121
97
109
96
4
103
57
55
105
109
80
56
21
20
54
109
60
98
82
6
5
109
7
22
23
53
14
19
81
1
3
48
47
41
25
43
16
44
2
9
17
26
37
18
45
10
34
42
49
34
123-1
112
99
30
50
85
39
52
31
34
109
87
35
32
36
33
88
28
51
133
89
132
123
124

Note:

The above exploded view is for the purpose of parts disassembly and replacement.

The non-numbered parts are not kept as standard service parts.

16.3.2. Replacement Parts List

<Model: CU-3E23CBPG>

Ref. No.	Part Name & Description	Q'ty	Part No.	Remarks
1	SWING COMPRESSOR	1	CW1266081	●
2	VIBRATION ISOLATOR	3	CW1289899	
3	NUT WITH WASHER	3	CWH56062	
4	TERMINAL COVER	1	CW1262647	
5	RUBBER BUSH, LEAD WIRE	1	CWH51260	
6	RETAINER, OVER-LOAD RELAY	1	CW380620	
7	SOUND INSULATOR, COMP. (TOP)	1	CW1306910	
9	SOUND INSULATOR, COMPRESSOR	1	CW1306934	
10	SOUND INSULATOR, COMPRESSOR	1	CW1306941	
12	CROSS-FIN CONDENSER ASS'Y	1	CW1305809	
14	FOUR WAY VALVE	1	CW1305830	●
16	DISCHARGE PIPE	1	CW1351802	
17	MUFFLER (SUCTION LINE)	1	CW1170298	
18	DISCHARGE PIPE	1	CW1351819	
19	CONNECTING PIPE	1	CW1351826	
20	CONNECTING PIPE	1	CW1351833	
21	SOLENOID VALVE ASS'Y	1	CW1313545	●
22	VIBRATION ABSORBER, REF. PIPING	1	CWH50085	
23	RETAINER, VIBRATION ABSORBER	1	CW0219253	
25	SET PLATE, STOP VALVE (1)	1	CW1364101	
26	SET PLATE, STOP VALVE (2)	1	CW1306996	
28	STOP VALVE ASS'Y (LIQUID LINE)	1	CW1305847	●
30	BODY, MOTORIZED EXP. VALVE	3	CW1296385	●
31	UNION JOINT	3	CW0603214	
32	STRAINER (FOR REF.)	3	CW1318230	
33	STRAINER (FOR REF.)	1	CW0085296	
34	PUTTY	3	CW1307014	
35	PUTTY	1	CW1313134	
36	SOUND ABSORBING PUTTY	1	CW962621	
37	FIXTURE, THERMISTOR	3	CW1303896	
39	STOP VALVE ASS'Y (GAS LINE)	1	CW1305854	●
41	UNION JOINT	3	CW257587	
42	FITTING SPRING, THERMISTOR	4	CW380120	
43	FIXTURE, UNION JOINT	1	CW1313141	
44	ACCUMULATOR ASS'Y	1	CW1305885	
45	CUSHION RUBBER, ACCUMULATOR	1	CW380116	
46	PUTTY	1	CW0640338	
47	FLARE NUT	3	CW0080347	
48	BLIND CAP, FLARE NUT	3	CW1020937	
49	FLARE NUT	3	CW1198474	
50	BLIND CAP, FLARE NUT	3	CW1020920	
51	CAP, STOP VALVE	1	CWH521017	
52	CAP, STOP VALVE	1	CW0079936	
53	FIXTURE, THERMISTOR	1	CW1107384	
54	SUCTION LINE ASS'Y	1	CW1351927	
55	PUTTY	1	CW1201589	
56	SOUND ABSORBING PUTTY	1	CW1128538	
57	SOUND ABSORBING PUTTY	1	CW0141521	
58	FAN BLADE	1	CW1183821	
59	LOCK NUT, FAN BLADE	1	CW847002	

Ref. No.	Part Name & Description	Q'ty	Part No.	Remarks
60	AIR DISCHARGE GRILLE	1	CW1314308	
61	GUARD NET	1	CW1182385	
63	SWITCH BOX	1	CW1307069	
64	CUSHION RUBBER	1	CW1307076	
65	PRINTED CIRCUIT ASS'Y	1	CW1364118	●
66	FUSE	1	CW0509002	
67	VARISTOR	1	CW0608055	●
68	WIRE HARNESS ASS'Y	1	CW1307083	
69	HEAT SINK	1	CW1289914	●
70	TERMINAL BLOCK	1	CW1364125	●
71	PRINTED CIRCUIT ASS'Y (INVERTER)	1	CW1290402	●
72	THERMISTOR	1	CW1302622	●
73	RECTIFING STACK	1	CW628953	
74	POWER TRANSISTOR MODULE	1	CW1289921	●
75	THERMISTOR ASS'Y	1	CW1302639	●
79	REACTOR	1	CW1305955	
80	WIRE HARNESS ASS'Y	1	CW1305962	
81	COIL, SOLENOID VALVE ASS'Y	1	CW1364132	●
82	COIL, SOLENOID VALVE	1	CW1296378	●
84	DC FAN MOTOR	1	CW1307160	●
85	MOTORIZED EXP. V COIL, ASS'Y	1	CW1313350	●
87	COIL, MOTORIZED EXP. VALVE	1	CW1305234	
88	COIL, MOTORIZED EXP. VALVE	1	CW1305241	
89	COIL, MOTORIZED EXP. VALVE	1	CW1305210	
90	THERMISTOR ASS'Y (LIQUID LINE)	1	CW1309438	●
91	THERMISTOR	3	CW1307223	
92	THERMISTOR ASS'Y (GAS LINE)	1	CW1309522	●
93	THERMISTOR	3	CW0115128	
94	DRIP PROOF COVER	1	CW1307247	
95	DRIP PROOF COVER	1	CW1307254	
96	WIRE HARNESS ASS'Y	1	CW1307261	
97	CLIP	1	CW1364156	
98	OVER-LOAD RELAY	1	CW622418	●
99	BOTTOM FRAME ASS'Y	1	CW1307278	
100	SIDE PLATE (RIGHT)	1	CW1307285	
101	SIDE PLATE (LEFT)	1	CW1182114	
102	FRONT PLATE	1	CW1195064	
103	PARTITION PLATE ASS'Y	1	CW1307292	
104	MOTOR BASE	1	CW1204153	
105	COVER, STOP VALVE	1	CW1313196	
106	HANDLE (LEFT)	1	CW1182361	
107	SOUND ABSORBING PUTTY	1	CW1307317	
108	SCREW WITH SPACER	4	CW1315363	
109	TRUSS HEAD TAPPING SCREW	35	CW0082033	
110	TOP PLATE	1	CW1182347	
112	DRAIN JOINT	1	CW0589565	
121	GROUNDING TERMINAL	2	CW1137835	
123	OPERATION MANUAL	1	CWF563678	
123-1	I/M (INDOOR)	1	CWF612315	
124	I/M (ENGLISH, GERMANY, FRENCH, DUTCH)	1	CW1364202	
132	I/M (SPANISH, ITALIAN, GREEK, PORTUGUESE)	1	CW1364271	

Ref. No.	Part Name & Description	Q’ty	Part No.	Remarks
133	I/M (RUSSIAN)	1	CW1364288	

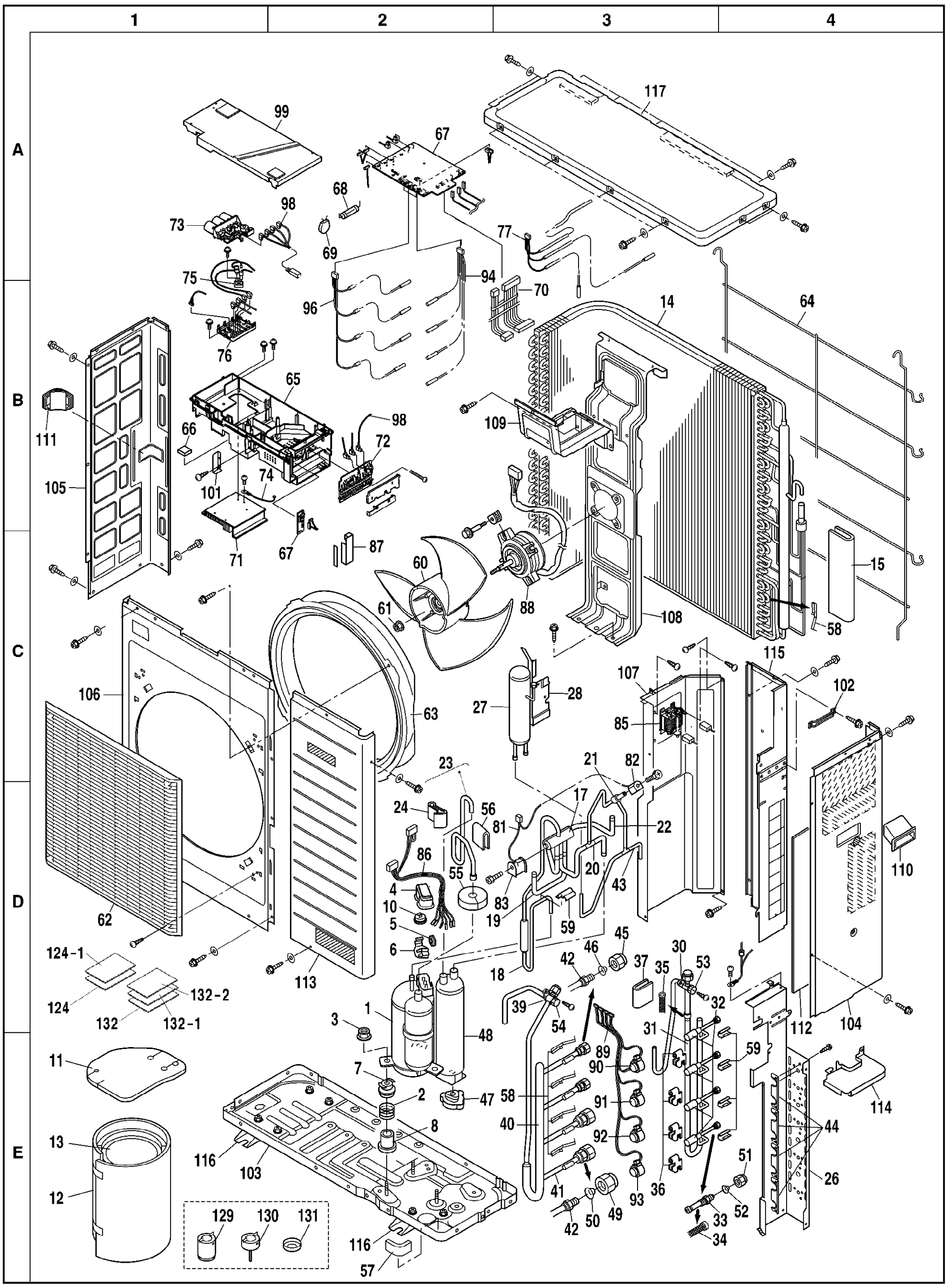
(Note)

- “ ● ” marked parts are recommended to be kept in stock.

- All parts are supplied from ACD, JAPAN (VENDER CODE: 00025800).

16.4. CU-4E27CBPG

16.4.1. Exploded View


1
2
3
4
A
B
C
D
E
117
99
67
98
68
73
69
77
75
94
70
96
14
64
76
65
98
111
66
72
109
101
74
105
87
67
71
60
88
15
61
108
58
106
115
107
102
27
28
63
85
21
82
23
24
56
17
22
81
86
110
20
4
55
43
83
10
19
59
62
5
45
46
30
124-1
6
42
37
35
53
18
132-2
113
32
124
132
132-1
1
39
54
31
112
104
3
48
89
90
59
11
7
2
47
58
91
114
8
40
92
44
13
116
103
51
41
93
36
26
12
129
130
131
42
50
49
33
52
34
116
57

Note:

The above exploded view is for the purpose of parts disassembly and replacement.

The non-numbered parts are not kept as standard service parts.

16.4.2. Replacement Parts List

<Model: CU-4E27CBPG>

Ref. No.	Part Name & Description	Q'ty	Part No.	Remarks
1	SWING COMPRESSOR	1	CW1266081	●
2	SPRING	3	CW390208	
3	NUT WITH WASHER	3	CWH56062	
4	TERMINAL COVER	1	CW1262647	
5	GUARD BUSH, POWER CORD	1	CW354120	
6	RETAINER, OVER-LOAD RELAY	1	CW380620	
7	SPRING HOLDER (1)	3	CW0960397	
8	SPRING HOLDER (2)	3	CW390215	
10	OVER-LOAD RELAY	1	CW1313747	●
11	SOUND INSULATOR, COMP. (TOP)	1	CW1313754	
12	SOUND INSULATOR, COMPRESSOR	1	CW1313761	
13	SOUND INSULATOR, COMPRESSOR	1	CW1313778	
14	CROSS-FIN CONDENSER ASS'Y	1	CW1313785	
15	PUTTY	1	CW0640338	
17	FOUR WAY VALVE	1	CW1305830	●
18	DISCHARGE PIPE ASS'Y	1	CW1354399	
19	CONNECTING PIPE	1	CW1354407	
20	CONNECTING PIPE	1	CW1354414	
21	SOLENOID VALVE ASS'Y	1	CW1313792	●
22	CONNECTING PIPE	1	CW1354421	
23	SUCTION LINE ASS'Y	1	CW1354438	
24	PUTTY	1	CW1201589	
26	SET PLATE, STOP VALVE	1	CW1313800	
27	LIQUID RECEIVER	1	CW1313817	
28	SET PLATE, STOP VALVE	1	CW1313824	
30	STOP VALVE ASS'Y (LIQUID LINE)	1	CW1313831	●
31	BRANCH PIPE	1	CW1354452	
32	BODY, MOTORIZED EXP. VALVE	4	CW1318533	●
33	UNION JOINT	4	CW0603214	
34	STRAINER (FOR REF.)	4	CW1318230	
35	STRAINER (FOR REF.)	1	CW0085296	
36	PUTTY	4	CW1307014	
37	SOUND ABSORBING PUTTY	1	CW1265374	
39	STOP VALVE ASS'Y (GAS LINE)	1	CW1314252	●
40	BRANCH PIPE	1	CW1354469	
41	CONNECTING PIPE	4	CW1354476	
42	UNION JOINT	4	CW257587	
43	CONNECTING PIPE	1	CW1354483	
44	FIXTURE UNION JOINT	4	CW1314269	
45	FLARE NUT	3	CW0080347	
46	BLIND CAP, FLARE NUT	3	CW1020937	
47	CUSHION RUBBER	1	CW1314276	
48	ACCUMULATOR ASS'Y	1	CW1314283	
49	FLARE NUT	1	CW0080347	
50	BLIND CAP, FLARE NUT	1	CW1020937	
51	FLARE NUT	4	CW1198474	
52	BLIND CAP, FLARE NUT	4	CW1020920	
53	CAP, STOP VALVE	1	CW0454328	
54	CAP, STOP VALVE	1	CW0079936	
55	SOUND ABSORBING PUTTY	1	CW1128538	
56	SOUND ABSORBING PUTTY	1	CW1040739	
57	PUTTY	1	CW1314290	

Ref. No.	Part Name & Description	Q'ty	Part No.	Remarks
58	FITTING SPRING, THERMISTOR	8	CW380120	
59	FIXTURE, THERMISTOR	4	CW1107384	
60	FAN BLADE	1	CW1264302	
61	LOCK NUT, FAN	1	CW847003	
62	AIR DISCHARGE GRILLE	1	CW1314308	
63	BELL MOUTH	1	CW1278882	
64	GUARD NET	1	CW1314315	
65	SWITCH BOX	1	CW1314322	
66	CUSHION RUBBER	1	CW1307076	
67	PRINTED CIRCUIT ASS'Y	1	CW1364295	●
68	FUSE	1	CW0509002	
69	VARISTOR	1	CW0608055	●
70	WIRE HARNESS ASS'Y	1	CW1307083	
71	HEAT SINK	1	CW1314339	●
72	TERMINAL BLOCK	1	CW1364303	●
73	PRINTED CIRCUIT ASS'Y (INVERTER)	1	CW1290402	●
74	THERMISTOR	1	CW1302622	●
75	RECTIFING STACK	1	CW628953	
76	POWER TRANSISTOR MODULE	1	CW1289921	●
77	THERMISTOR ASS'Y	1	CW1296633	●
81	COIL, SOLENOID VALVE ASS'Y	1	CW1364310	●
82	COIL, SOLENOID VALVE	1	CW1296378	●
83	COIL, FOUR WAY VALVE	1	CW1176304	
85	REACTOR	1	CW1305955	
86	WIRE HARNESS ASS'Y	1	CW1314377	
87	DRIP PROOF COVER	1	CW1307247	
88	DC FAN MOTOR	1	CW1314384	●
89	MOTORIZED EXP. V COIL ASS'Y	1	CW1314391	●
90	COIL, MOTORIZED EXP. VALVE	1	CW1296392	
91	COIL, MOTORIZED EXP. VALVE	1	CW1296400	
92	COIL, MOTORIZED EXP. VALVE	1	CW1296417	
93	COIL, MOTORIZED EXP. VALVE	1	CW1296424	
94	THERMISTOR ASS'Y (LIQUID LINE)	1	CW1296671	●
96	THERMISTOR ASS'Y (GAS LINE)	1	CW1296710	●
98	WIRE HARNESS ASS'Y	1	CW1364334	
99	DRIP PROOF COVER	1	CW1307835	
101	BYPASS PROTECTOR	1	CW1314409	
102	CLIP	1	CW1364156	
103	BOTTOM FRAME ASS'Y	1	CW1279359	
104	SIDE PLATE (RIGHT)	1	CW1314423	
105	SIDE PLATE (LEFT)	1	CW1279335	
106	FRONT PLATE (1)	1	CW1279272	
107	PARTITION PLATE	1	CW1314430	
108	MOTOR BASE (1)	1	CW1279373	
109	MOTOR BASE	1	CW1314447	
110	HANDLE	1	CW353605	
111	HANDLE	1	CW1314454	
112	SOUND INSULATOR	1	CW1314461	
113	FRONT PLATE	1	CW1314478	
114	PARTITION PLATE	1	CW1314485	
115	REAR PLATE	1	CW1314492	

Ref. No.	Part Name & Description	Q’ty	Part No.	Remarks
116	ANCHOR PLATE	2	CW0423920	
117	TOP PLATE	1	CW1278558	
124	OPERATION MANUAL	1	CWF563678	
124-1	I/M (INDOOR)	1	CWF612315	
129	DRAIN SOCKET	1	CW537651	
130	CAP DRAIN SOCKET	2	CW1314593	
131	DRAIN TERMINAL	3	CW1314601	
132	I/M (ENGLISH, GERMANY, FRENCH, DUTCH)	1	CW1364202	
132-1	I/M (SPANISH, ITALIAN, GREEK, PORTUGUESE)	1	CW1364271	
132-2	I/M (RUSSIAN)	1	CW1364288	

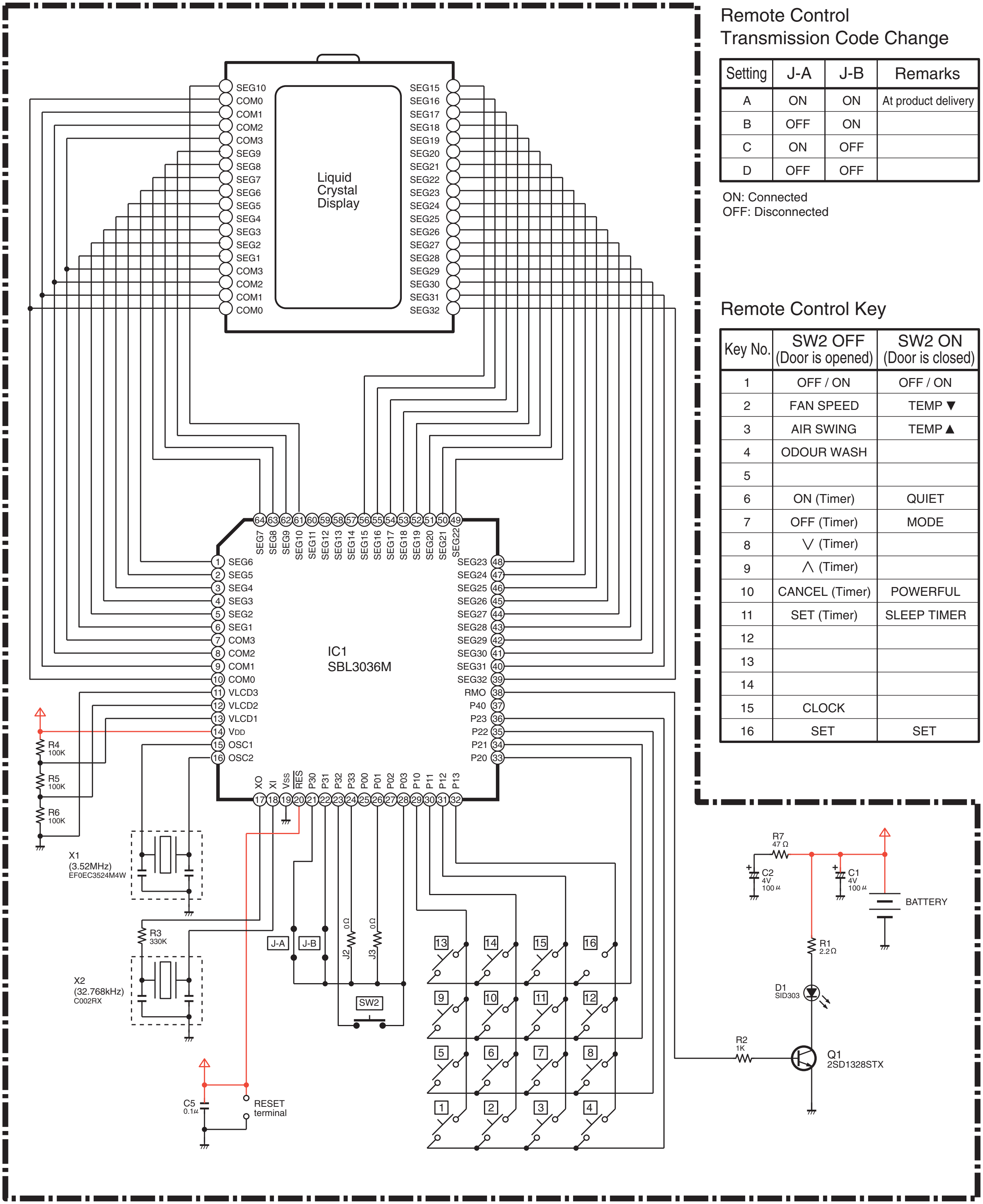
(Note)

- “ ● ” marked parts are recommended to be kept in stock.

- All parts are supplied from ACD, JAPAN (VENDER CODE: 00025800).

Printed in Japan

CS-ME7CKPG, CS-ME10CKPG, CS-ME12CKPG, CS-ME14CKPG, CS-ME18CKPG



Liquid Crystal Display
SEG10
COM0
COM1
COM2
COM3
SEG9
SEG8
SEG7
SEG6
SEG5
SEG4
SEG3
SEG2
SEG1
COM3
COM2
COM1
COM0
SEG15
SEG16
SEG17
SEG18
SEG19
SEG20
SEG21
SEG22
SEG23
SEG24
SEG25
SEG26
SEG27
SEG28
SEG29
SEG30
SEG31
SEG32
IC1
SBL3036M
1 SEG6
2 SEG5
3 SEG4
4 SEG3
5 SEG2
6 SEG1
7 COM3
8 COM2
9 COM1
10 COM0
11 VLCD3
12 VLCD2
13 VLCD1
14 VDD
15 OSC1
16 OSC2
17 XO
18 XI
19 Vss
20 RES
21 P30
22 P31
23 P32
24 P33
25 P00
26 P01
27 P02
28 P03
29 P10
30 P11
31 P12
32 P13
33 P20
34 P21
35 P22
36 P23
37 P40
38 RMO
39 SEG32
40 SEG31
41 SEG30
42 SEG29
43 SEG28
44 SEG27
45 SEG26
46 SEG25
47 SEG24
48 SEG23
49 SEG22
50 SEG21
51 SEG20
52 SEG19
53 SEG18
54 SEG17
55 SEG16
56 SEG15
57 SEG14
58 SEG13
59 SEG12
60 SEG11
61 SEG10
62 SEG9
63 SEG8
64 SEG7
R4 100K
R5 100K
R6 100K
X1 (3.52MHz) EF0EC3524M4W
R3 330K
X2 (32.768kHz) C002RX
C5 0.1μ
RESET terminal
J-A
J-B
J2 0Ω
J3 0Ω
SW2
13
14
15
16
9
10
11
12
5
6
7
8
1
2
3
4
R7 47Ω
C2 4V 100μ
C1 4V 100μ
BATTERY
R1 2.2Ω
D1 SID303
R2 1K
Q1 2SD1328STX

Remote Control Transmission Code Change

Setting	J-A	J-B	Remarks
A	ON	ON	At product delivery
B	OFF	ON	
C	ON	OFF	
D	OFF	OFF	

ON: Connected
OFF: Disconnected

Remote Control Key

Key No.	SW2 OFF (Door is opened)	SW2 ON (Door is closed)
1	OFF / ON	OFF / ON
2	FAN SPEED	TEMP ▼
3	AIR SWING	TEMP ▲
4	ODOUR WASH	
5		
6	ON (Timer)	QUIET
7	OFF (Timer)	MODE
8	⋁ (Timer)	
9	⋀ (Timer)	
10	CANCEL (Timer)	POWERFUL
11	SET (Timer)	SLEEP TIMER
12		
13		
14		
15	CLOCK	
16	SET	SET

Required tools for Installation Works

1. Philips screw driver
2. Level gauge
3. Electric drill, hole core drill (ø70 mm)
4. Hexagonal wrench (4 mm)
5. Spanner
6. Pipe cutter
7. Reamer
8. Knife
9. Gas leak detector
10. Measuring tape
11. Thermometer
12. Megameter
13. Multimeter
14. Torque wrench
    - 18 N•m (1.8 kgf.m)
    - 42 N•m (4.2 kgf.m)
    - 55 N•m (5.5 kgf.m)
15. Vacuum pump
16. Gauge manifold

SAFETY PRECAUTIONS

- Read the following “SAFETY PRECAUTIONS” carefully before installation.
- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below.Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

⚠ WARNING	This indication shows the possibility of causing death or serious injury.
⚠ CAUTION	This indication shows the possibility of causing injury or damage to properties only.

The items to be followed are classified by the symbols:

🛇	Symbol with background white denotes item that is PROHIBITED from doing.

- Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

⚠ WARNING

1) Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.

2) Install according to this installation instruction strictly. If installation is defective, it will cause water leakage, electrical shock or fire.

3) Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.

4) Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.

5) For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.

6) Use the specified cable (1.5 mm^2) and connect tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.

7) Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.

8) When carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle.
Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury. 🛇

9) When connecting the piping, do not allow air or any substances other than the specified refrigerant (R410A) to enter the refrigeration cycle. Otherwise, this may lower the capacity, cause abnormally high pressure in the refrigeration cycle, and possibly result in explosion and injury. 🛇

10)
- When connecting the piping, do not use any existing (R22) pipes and flare nuts. Using such same may cause abnormally high pressure in the refrigeration cycle (piping), and possibly result in explosion and injury. Use only R410A materials.
- Thickness of copper pipes used with R410A must be more than 0.8 mm. Never use copper pipes thinner than 0.8 mm.
- It is desirable that the amount of residual oil is less than 40 mg/10 m.

🛇

11) Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock. 🛇

⚠ CAUTION

1) This equipment must be earthed. It may cause electrical shock if grounding is not perfect.

2) Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire. 🛇

3) Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.

ATTENTION

1) Selection of the installation location.
Select a installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.

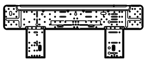
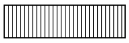
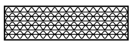
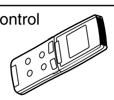
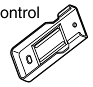
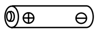
2) Power supply connection to the room air conditioner.
Connect the power supply cord of the room air conditioner to the mains using one of the following method.
Power supply point shall be the place where there is ease for access for the power disconnection in case of emergency.
In some countries, permanent connection of this room air conditioner to the power supply is prohibited.
1) Power supply connection to the receptacle using a power plug.
Use an approved 15A/16A power plug with earth pin for the connection to the socket.
2) Power supply connection to a circuit breaker for the permanent connection. Use an approved 16A circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3 mm contact gap.

3) Do not release refrigerant.
Do not release refrigerant during piping work for installation, reinstallation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.

4) Installation work.
It may need two people to carry out the installation work.

5) Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.

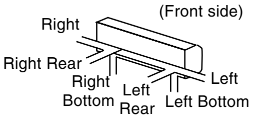
Attached accessories.

No.	Accessories part	Qty.	No.	Accessories part	Qty.
1	Installation plate 	1	5	Air purifying filter 	1
2	Installation plate fixing screw 	6	6	Solar refreshing deodorizing filter 	1
3	Remote control 	1	7	Remote control holder 	1
4	Battery 	2	8	Remote control holder fixing screw 	2

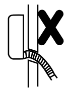
Applicable piping kit CZ-3F5, 7AEN

Indoor Unit Installation Diagram

Piping direction

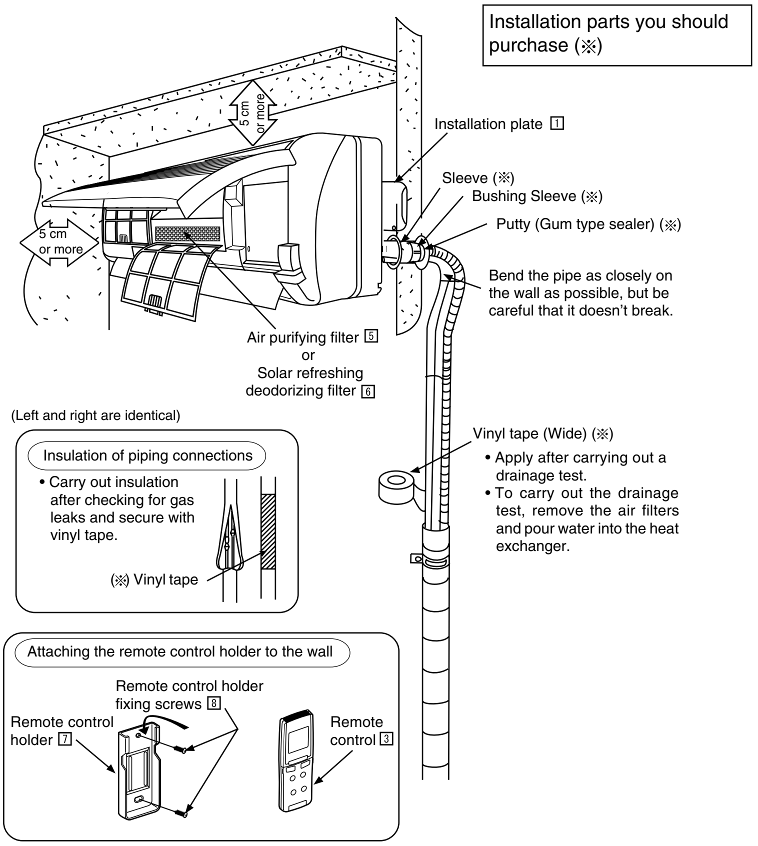

(Front side)
Right
Right Rear
Right Bottom
Left Rear
Left
Left Bottom

Attention not to bend up drain hose



1 SELECT THE BEST LOCATION

- ☐ There should not be any heat source or steam near the unit.
- ☐ There should not be any obstacles blocking the air circulation.
- ☐ A place where air circulation in the room is good.
- ☐ A place where drainage can be easily done.
- ☐ A place where noise prevention is taken into consideration.
- ☐ Do not install the unit near the door way.
- ☐ Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- ☐ Recommended installation height for indoor unit shall be at least 2.3 m.


Installation parts you should purchase (※)
5 cm or more
5 cm or more
Installation plate 1
Sleeve (※)
Bushing Sleeve (※)
Putty (Gum type sealer) (※)
Air purifying filter 5
or
Solar refreshing deodorizing filter 6
Vinyl tape (Wide) (※)
Insulation of piping connections
(※) Vinyl tape
Attaching the remote control holder to the wall
Remote control holder fixing screws 8
Remote control holder 7
Remote control 3

Bend the pipe as closely on the wall as possible, but be careful that it doesn't break.

(Left and right are identical)

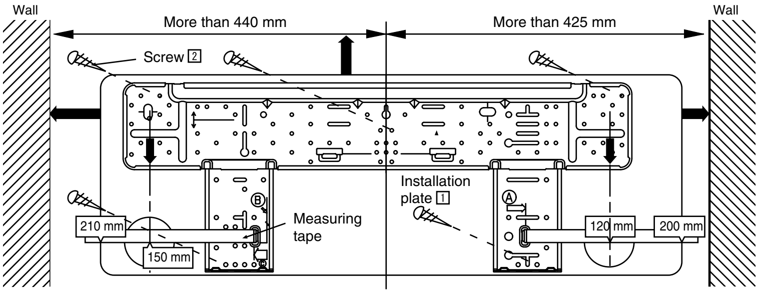
- Apply after carrying out a drainage test.
- To carry out the drainage test, remove the air filters and pour water into the heat exchanger.

- Carry out insulation after checking for gas leaks and secure with vinyl tape.

2

HOW TO FIX INSTALLATION PLATE

The mounting wall is strong and solid enough to prevent it from the vibration.


Wall
More than 440 mm
More than 425 mm
Wall
Screw 2
Installation plate 1
Ⓑ
Ⓐ
Measuring tape
210 mm
150 mm
120 mm
200 mm

The center of installation plate should be at more than 425 mm at right of the wall.
The centre of installation plate should be at more than 440 mm at left of the wall.
The distance from installation plate edge to ceiling should more than 67 mm.
From installation plate left edge to unit's left side is 37 mm.
From installation plate right edge to unit's right is 59 mm.

Ⓑ : For left side piping, piping connection for liquid should be about 95 mm from this line.
: For left side piping, piping connection for gas should be about 155 mm from this line.
: For left side piping, piping connecting cable should be about 800 mm from this line.

1. Mount the installation plate on the wall with 5 screws or more.
   (If mounting the unit on the concrete wall consider using anchor bolts.)
   - Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.
2. Drill the piping plate hole with ø70 mm hole-core drill.
   - Line according to the arrows marked on the lower left and right side of the installation plate. The meeting point of the extended line is the centre of the hole.Another method is by putting measuring tape at position as shown in the diagram above. The hole centre is obtained by measuring the distance namely 150 mm and 120 mm for left and right hole respectively.
   - Drill the piping hole at either the right or the left and the hole should be slightly slanted to the outdoor side.

3

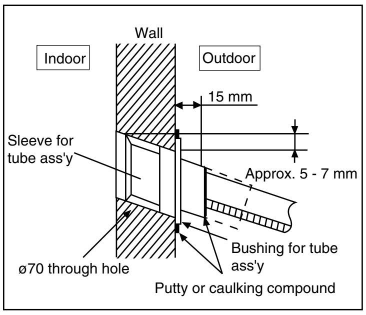
TO DRILL A HOLE IN THE WALL AND INSTALL A SLEEVE OF PIPING

1. Insert the piping sleeve to the hole.
2. Fix the bushing to the sleeve.
3. Cut the sleeve until it extrudes about 15 mm from the wall.

CAUTION

When the wall is hollow, please be sure to use the sleeve for tube ass'y to prevent dangers caused by mice biting the connecting cable.

4. Finish by sealing the sleeve with putty or caulking compound at the final stage.


Wall
Indoor
Outdoor
15 mm
Sleeve for tube ass'y
Approx. 5 - 7 mm
Bushing for tube ass'y
ø70 through hole
Putty or caulking compound

4 INDOOR UNIT INSTALLATION

1. FOR THE RIGHT REAR PIPING

Pull out the Indoor piping

⬇

Install the Indoor Unit

⬇

Secure the Indoor Unit

⬇

Insert the connecting cable

2. FOR THE RIGHT AND RIGHT BOTTOM PIPING

Pull out the Indoor piping

⬇

Install the Indoor Unit

⬇

Insert the connecting cable

⬇

Secure the Indoor Unit

3. FOR THE EMBEDDED PIPING

Replace the drain hose

⬇

Bend the embedded piping

- Use a spring bender or equivalent to bend the piping so that the piping is not crushed.

Install the Indoor Unit

⬇

Cut and flare the embedded piping

- When determining the dimensions of the piping, slide the unit all the way to the left on the installation plate.
- Refer to the section “Cutting and flaring the piping”.

Pull the connecting cable into Indoor Unit

- The inside and outside connecting cable can be connected without removing the front grille.

Connect the piping

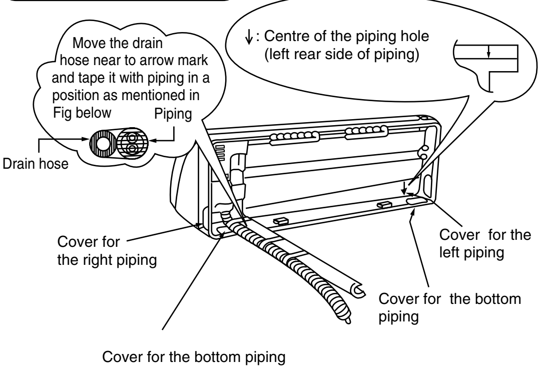
- Please refer to “Connecting the piping” column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Insulate and finish the piping

- Please refer to “Piping and finishing” column of outdoor section and “Insulation of piping connections” column as mentioned in Indoor/ Outdoor Unit Installation.

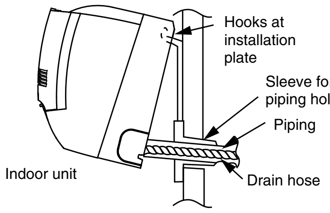
Secure the Indoor Unit

Pull out the piping and drain hose


Move the drain hose near to arrow mark and tape it with piping in a position as mentioned in Fig below
Drain hose
Piping
↓: Centre of the piping hole (left rear side of piping)
Cover for the right piping
Cover for the left piping
Cover for the bottom piping
Cover for the bottom piping

Install the Indoor Unit

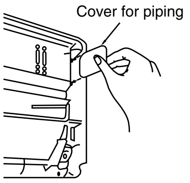
Hook the indoor unit onto the upper portion of installation plate(Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving in left and right.


Hooks at installation plate
Sleeve for piping hole
Piping
Indoor unit
Drain hose

How to keep the cover

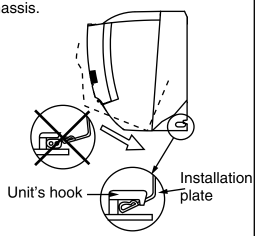
In case of the cover is cut, keep the cover at the rear of chassis as shown in the illustration for future reinstallation.

(Left, right and 2 bottom covers for piping)

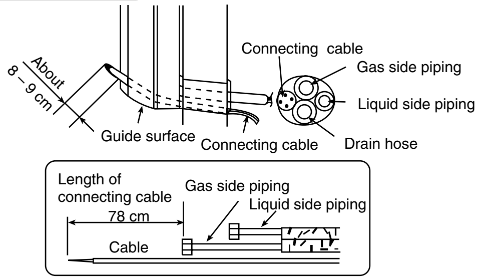

Cover for piping

Secure the Indoor Unit

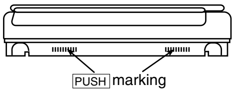
1. Tape the extra power supply cord in a bundle and keep it behind the chassis.
   - Ensure that the power supply cord is not clamped in between the unit's hook (2 positions) and installation plate.
2. Press the lower left and right side of the unit against the installation plate until hooks engages with their slots (sound click).


Unit's hook
Installation plate

Insert the connecting cable


About 8 ~ 9 cm
Connecting cable
Gas side piping
Liquid side piping
Guide surface
Connecting cable
Drain hose
Length of connecting cable
78 cm
Cable
Gas side piping
Liquid side piping

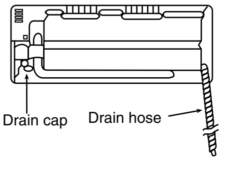
To take out the unit, push the PUSH marking at the bottom unit , and pull it slightly towards you to disengage the hooks from the unit.

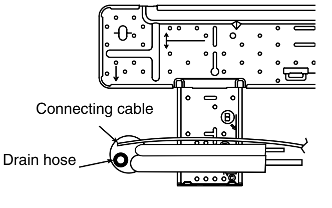

PUSH marking

(This can be used for left rear piping & left bottom piping also.)

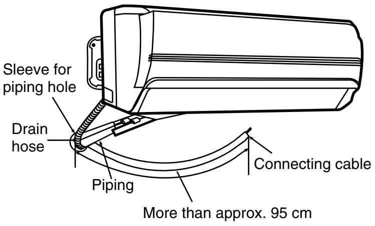
Exchange the drain hose and the cap

Rear view for left piping installation

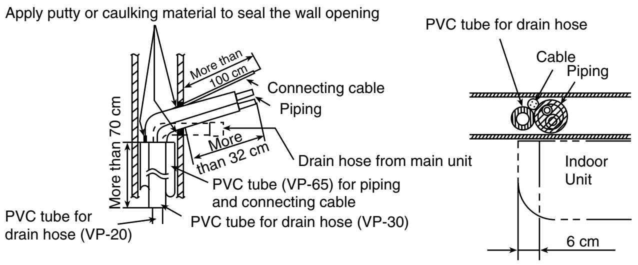

Drain cap
Drain hose


Connecting cable
Drain hose
B

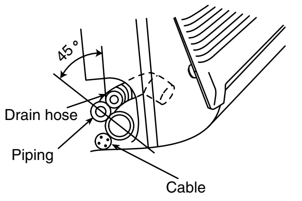
Adjust the piping slightly downwards.


Sleeve for piping hole
Drain hose
Piping
Connecting cable
More than approx. 95 cm

- How to pull the piping and drain hose out, in case of the embedded piping.


Apply putty or caulking material to seal the wall opening
More than 100 cm
Connecting cable
Piping
More than 70 cm
More than 32 cm
Drain hose from main unit
PVC tube (VP-65) for piping and connecting cable
PVC tube for drain hose (VP-30)
PVC tube for drain hose (VP-20)
PVC tube for drain hose
Cable
Piping
Indoor Unit
6 cm

- In case of left piping how to insert the connecting cable and drain hose.

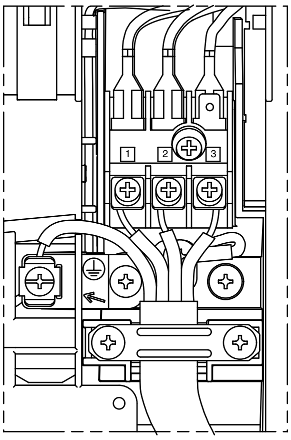

45°
Drain hose
Piping
Cable

(For the right piping, follow the same procedure)

5 CONNECT THE CABLE TO THE INDOOR UNIT

1. The inside and outside connecting cable can be connected without removing the front grille.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 4 x 1.5 mm^2 flexible cord, type designation 245 IEC 57(H05RN-F) or heavier cord.

- Ensure the color of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
- Earth lead wire shall be longer than the other lead wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.

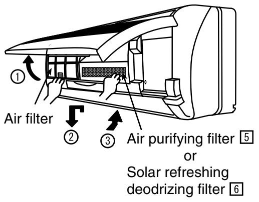


Terminals on the indoor unit	1	2	3	⏚
Color of wires	░	▒	▓	█
Terminals on the outdoor unit	1	2	3	⏚

- Secure the cable onto the control board with the holder (clamper).

INSTALLATION OF AIR PURIFYING FILTERS

1. Open the front panel.
2. Remove the air filters.
3. Put air purifying filter (left) and solar refreshing deodorizing filter (right) into place as shown in illustration at right.

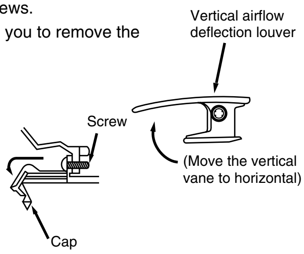


HOW TO TAKE OUT FRONT GRILLE

Please follow the steps below to take out front grille if necessary such as when servicing.

1. Set the vertical airflow direction louver to the horizontal position.
2. Slide down the two caps on the front grille as shown in the illustration at right, and then remove the two mounting screws.
3. Pull the lower section of the front grille towards you to remove the front grille.

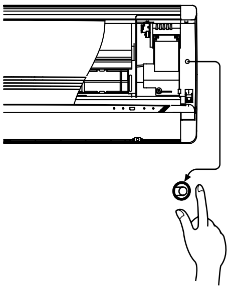
When reinstalling the front grille, first set the vertical airflow direction louver to the horizontal position and then carry out above steps 2 - 3 in the reverse order.



AUTO SWITCH OPERATION

The below operations will be performed by pressing the “AUTO” switch.

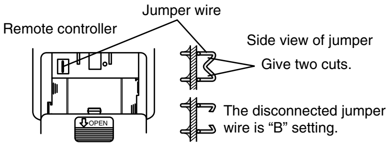
1. AUTO OPERATION MODE
   The Auto operation will be activated immediately once the Auto Switch is pressed.
2. TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)
   The Test Run operation will be activated if the Auto Switch is pressed continuously for more than 5 sec. to below 8 sec..
   A “pep” sound will occur at the fifth sec., in order to identify the starting of Test Run operation.



Changing the remote control transmission code

- When installing two air conditioners in one room, each air conditioner can be synchronized to the remote control.
  In order to operate separately, open the rear cover of one of the remote control and set to “B”.

Set “B” on the remote control.
This can be achieved by cutting the jumper wire of the remote control with a cutter.

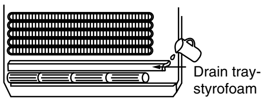


Setting the air conditioner unit to “B”

1. Press the “AUTO” switch for about 11 to 15 seconds. When you hear three short beeps “pep, pep, pep”, release the switch.
   Note: you will hear one beep “pep” in about 5 seconds, and then two beeps “pep, pep” in about 8 seconds.
2. Press again the “AUTO” switch within 60 seconds. Every press the “AUTO” switch, you will hear a short beep “pep”. When you hear eventually a long beep “peep”, stop pressing the “AUTO” switch , which achieves “B” setting.
   If you stop pressing the “AUTO” switch midway at the short beep “pep”, this will achieve “A” setting.
3. After 60 seconds or longer of the above setting, use the “B” set remote control to confirm successful operation.

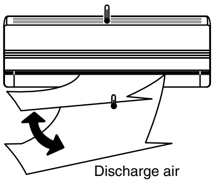
CHECK THE DRAINAGE

- Open front panel and remove air filters.
  (Drainage checking can be carried out without removing the front grille.)
- Pour a glass of water into the drain tray-styrofoam.
- Ensure that water flows out from drain hose of the indoor unit.



EVALUATION OF THE PERFORMANCE

- Operate the unit at cooling operation mode for fifteen minutes or more.
- Measure the temperature of the intake and discharge air.
- Ensure the difference between the intake temperature and the discharge is more than 8 ℃.



CHECK ITEMS

☐ Is there any gas leakage at flare nut connections?
☐ Has the heat insulation been carried out at flare nut connection?
☐ Is the connecting cable being fixed to terminal board firmly?
☐ Is the connecting cable being clamped firmly?
☐ Is the drainage ok? (Refer to “Check the drainage” section)
☐ Is the earth wire connection properly done?
☐ Is the indoor unit properly hooked to the installation plate?
☐ Is the power supply voltage complied with rated value?
☐ Is there any abnormal sound?
☐ Is the cooling operation normal?
☐ Is the thermostat operation normal?
☐ Is the remote control’s LCD operation normal?
☐ Is the air purifying filter installed?

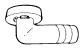
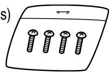
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
Web Site : http://www.panasonic.co.jp/global/

ENGLISH

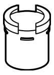
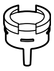
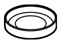
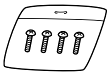
F612315
PRINTED IN JAPAN

Accessories

Accessories supplied with the outdoor unit: CU-3E23CBPG

(A) Drain plug  There is on the bottom packing case.	1	(B) Screw bag (For fixing electrical wire anchor bands)  There is on the bottom packing case.	1
(C) Installation Manual	4	(D) Operation Manual	1

Accessories supplied with the outdoor unit: CU-4E27CBPG

(A) Drain socket 	1	(B) Drain cap 	2	(C) Drain receiver 	3
(D) Screw bag (For fixing electrical wire anchor bands) 	1	(E) Installation Manual	4	(F) Operation Manual	1

Precautions for Selecting the Location

Outdoor Unit

1) Choose a place solid enough to bear the weight and vibration of the unit, where the operation noise will not be amplified.
2) Choose a location where the hot air discharged from the unit or the operation noise, will not cause a nuisance to the neighbors of the user.
3) Avoid places near a bedroom and the like, so that the operation noise will cause no trouble.
4) There must be sufficient spaces for carrying the unit into and out of the site.
5) There must be sufficient space for air passage and no obstructions around the air inlet and the air outlet.
6) The site must be free from the possibility of flammable gas leakage in a nearby place. Locate the unit so that the noise and the discharged hot air will not annoy the neighbors.
7) Install units, power cords and inter-unit cables at least 3 meter away from television and radio sets. This is to prevent interference to images and sounds. (Noises may be heard even if they are more than 3 meter away depending on radio wave conditions.)
8) In coastal areas or other places with salty atmosphere of sulfate gas, corrosion may shorten the life of the air conditioner.
9) Since drain flows out of the outdoor unit, do not place under the unit anything which must be kept away from moisture.

Note

Cannot be installed hanging from ceiling or stacked.

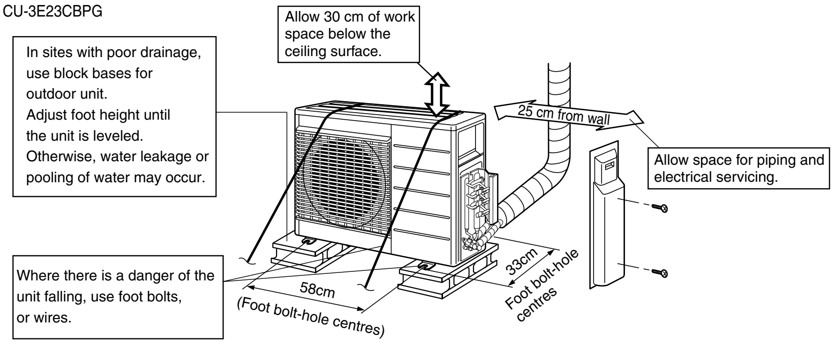
Outdoor Unit Installation Drawings

For installation of the indoor units, refer to the installation manual which was provided with the units.
(The diagram shows a wall-mounted indoor unit.)

⚠ CAUTION

- Do not connect the embedded branch piping and the outdoor unit when only carrying out piping work without connecting the indoor unit in order to add another indoor unit later.
  Make sure no dirt or moisture gets into either side of the embedded branch piping.
  See "6 Refrigerant Piping Work" for details.
- It is impossible to connect the indoor unit for one room only. **Be sure to connect at least 2 rooms**.

CU-3E23CBPG



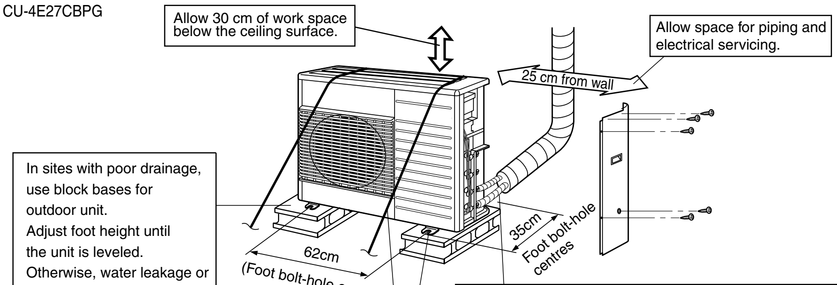
In sites with poor drainage, use block bases for outdoor unit.
Adjust foot height until the unit is leveled.
Otherwise, water leakage or pooling of water may occur.

Allow 30 cm of work space below the ceiling surface.

Allow space for piping and electrical servicing.

Where there is a danger of the unit falling, use foot bolts, or wires.

CU-4E27CBPG



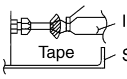
Allow 30 cm of work space below the ceiling surface.

Allow space for piping and electrical servicing.

In sites with poor drainage, use block bases for outdoor unit.
Adjust foot height until the unit is leveled.
Otherwise, water leakage or pooling of water may occur.

Where there is a danger of the unit falling, use foot bolts, or wires.

Also insulate the connection on the outdoor unit.



Use tape or insulating material on all connections to prevent air from getting in between the copper piping and the insulation tube.
Be sure to do this if the outdoor unit is installed above.

Installation

- Install the unit horizontally.
- The unit may be installed directly on a concrete verandah or a solid place if drainage is good.
- If the vibration may possibly be transmitted to the building, use a vibration-proof rubber (field supply).

Connections (connection port)

Install the indoor unit according to the table below, which shows the relationship between the class of indoor unit and the corresponding port.
The total indoor unit class that can be connected to this unit:

CU-3E23CBPG	5.0kW - 10.0kW
CU-4E27CBPG	5.0kW - 13.6kW

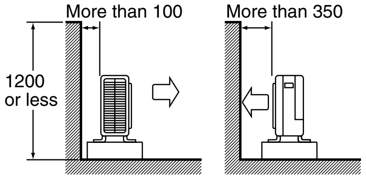
Indoor Unit

CS-ME7CKPG	: 2.2kW
CS-ME10CKPG	: 2.8kW
CS-ME12CKPG	: 3.2kW
CS-ME14CKPG	: 4.0kW
CS-ME18CKPG	: 5.0kW

Outdoor Unit Installation Guidelines

- Where a wall or other obstacle is in the path of outdoor unit's intake or exhaust airflow, follow the installation guidelines below.
- For any of the below installation patterns, the wall height on the exhaust side should be 1200 mm or less.

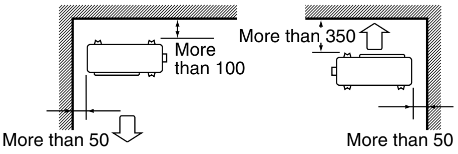
Wall facing one side



More than 100
More than 350
1200
or less

Side view

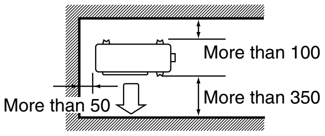
Walls facing two sides



More
than 100
More than 350
More than 50
More than 50

Top view

Walls facing three sides



More than 100
More than 50
More than 350

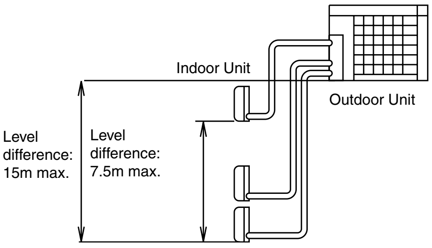
Top view

Unit: mm

Selecting a location for installation of the indoor units

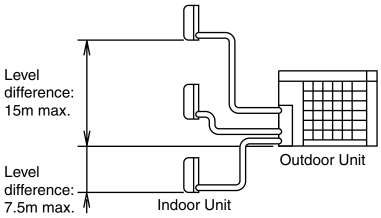
- The maximum allowable length of refrigerant piping, and the maximum allowable height difference between the outdoor and indoor units, are listed below.
  (The shorter the refrigerant piping, the better the performance. Connect so that the piping is as short as possible. **Shortest allowable length per room is 3 m**.)

Outdoor unit	CU-4E27CBPG	CU-3E23CBPG
Piping to each indoor unit	25 m max.	25 m max.
Total length of piping between all units	70 m max.	50 m max.



Indoor Unit
Outdoor Unit
Level
difference:
15m max.
Level
difference:
7.5m max.

If the outdoor unit is positioned higher than the indoor units.



Level
difference:
15m max.
Level
difference:
7.5m max.
Outdoor Unit
Indoor Unit

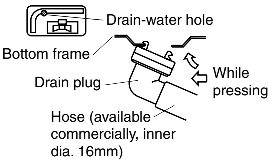
If the outdoor unit is positioned otherwise.
(If lower than one or more indoor units)

Outdoor Unit

1 Installing Outdoor Unit

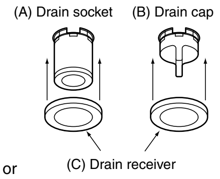
- When installing the outdoor unit, refer to “Precautions for Selecting the Location” and the “Indoor/outdoor Unit Installation Drawings.”
- If drain work is necessary, follow the procedures below.

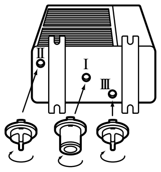
2 Drain Work



(CU-3E23CBPG)
- Use drain plug for drainage.
- If the drain port is covered by a mounting base or floor surface, place additional foot bases of at least 30 mm in height under the outdoor unit’s feet.
- In cold areas, do not use a drain hose with the outdoor unit. (Otherwise, drain water may freeze, impairing heating performance.)

(CU-4E27CBPG)
1. Insert drain receiver (C) onto drain socket (A) and drain cap (B) beyond 4 projections around drain socket and drain cap.
2. Insert drain socket and drain caps into their matching drain hole ; Drain socket (A) into drain hole Ⅰ and drain caps (B) into drain hole Ⅱ and Ⅲ. After insertion, turn them about 40 clockwise.





(Be sure not to insert them into wrong drain holes, or there causes water leakage.)

(View from bottom)

3. Connect vinyl hose on the market (intemal diameter of 25 mm) to drain socket (A) (If the house is too long and hangs down, fix it carefully to prevent the kinks.)

Note

If the drain holes of the outdoor unit are covered with the mounting bracket or the floor, raise the unit to provide the space of more than 100mm under the leg of the outdoor unit.

3 Refrigerant Piping

1. Align the centres of both flares and tighten the flare nuts 3 or 4 turns by hand. Then tighten them fully with the torque wrenches.
   - Use torque wrenches when tightening the flare nuts to prevent damage to the flare nuts and escaping gas.

Flare nut tightening torque	
Flare nut for Φ6.4	14.2-17.2N·m (144-175kgf·cm)
Flare nut for Φ9.5	32.7-39.9N·m (333-407kgf·cm)

Valve cap tightening torque
Liquid pipe 26.5-32.3N·m (270-330kgf·cm)

Service port cap tightening torque
10.8-14.7N·m (110-150kgf·cm)

2. To prevent gas leakage, apply refrigeration machine oil on both inner and outer surfaces of the flare. (Use refrigeration oil for R-410A)

4 Purging Air and Checking Gas Leakage

- When piping work is completed, it is necessary to purge the air and check for gas leakage.

5 Charging with Refrigerant

- If the total length of piping for all rooms exceeds the figure listed below, additionally charge with **20 g of** refrigerant (R-410A) for each additional meter of piping.

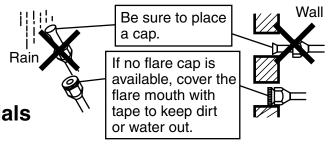
Outdoor capacity class	CU-4E27CBPG	CU-3E23CBPG
Total length of piping for all rooms	40m	30m

⚠CAUTION

Even though the shut-off valve is fully closed, the refrigerant may slowly leak out; do not leave the flare nut removed for a long period of time.

6 Refrigerant Piping Work

Cautions on Pipe Handling



Be sure to place a cap.

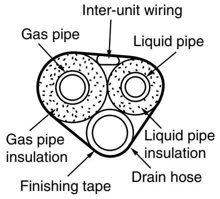
If no flare cap is available, cover the flare mouth with tape to keep dirt or water out.

- Protect the open end of the pipe against dust and moisture.
- All pipe bends should be as gentle as possible. Use a pipe bender for bending. (Bending radius should be 30 to 40 mm or larger.)

Selection of Copper and Heat Insulation materials

When using commercial copper pipes and fittings, observe the following:
- Insulation material: Polyethylene foam
  Heat transfer rate: 0.041 to 0.052kW/mK (0.035 to 0.045 kcal/mh ℃)
  Refrigerant gas pipe’s surface temperature reaches 110 ℃ max.
  Choose heat insulation materials that will withstand this temperature.
- Be sure to insulate both the gas and liquid piping and to provide insulation dimensions as below.

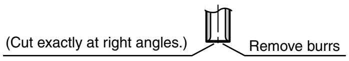
Pipe size	Pipe insulation
O.D : 6.4mm / Thickness : 0.8mm	I.D : 8-10mm / Thickness : 10mm min.
O.D : 9.5mm, 12.7mm / Thickness : 0.8mm	I.D : 12-15mm / Thickness : 13mm min.
O.D : 15.9mm / Thickness : 1.0mm	I.D : 16-20mm / Thickness : 13mm min.



- Use separate thermal insulation pipes for gas and liquid refrigerant pipes.

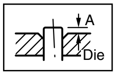
7 Flaring the Pipe End

1. Cut the pipe end with a pipe cutter.
2. Remove burrs with the cut surface facing downward so that the chips do not enter the pipe.
3. Put the flare nut on the pipe.
4. Flare the pipe.
5. Check that the flaring is properly made.



Flaring

Set exactly at the position shown below.

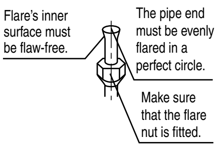


	Flare tool for R-410A	Conventional flare tool	
	Clutch-type	Clutch-type (Rigid-type)	Wing-nut type (Imperial-type)
A	0 ~ 0.5 mm	1.0 ~ 1.5 mm	1.5 ~ 2.0 mm

⚠ WARNING

Do not use mineral oil on flared part.
Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.
Never use piping which has been used for previous installation. Only use parts which are delivered with the unit.
Do never install a drier to this R-410A unit in order to guarantee its lifetime.
The drying material may dissolve and damage the system.
Incomplete flaring may cause refrigerant gas leakage.

Check


Flare's inner surface must be flaw-free.
The pipe end must be evenly flared in a perfect circle.
Make sure that the flare nut is fitted.

Purging Air and Checking Gas Leakage

⚠WARNING

Do not mix any substance other than the specified refrigerant (R-410A) into the refrigeration cycle.

⚠WARNING

If refrigerant gas leaked during air purging, ventilate the room as soon as possible.

To prevent air pollution, a vacuum pump should be used for air purging wherever possible.

⚠WARNING

Use a vacuum pump for R-410A exclusively. Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.

- If using additional refrigerant, perform air purging from the refrigerant pipes and indoor unit using a vacuum pump, then charge additional refrigerant.
- Use a hexagonal wrench (4 mm) to operate the shut-off valve rod.
- All refrigerant pipe joints should be tightened with a torque wrench at the specified tightening torque.

(1) Connect projection side (on which worm pin is pressed) of charging hose (which comes from gauge manifold) to gas shut-off valve's service port.

(2) Fully open gauge manifold's low-pressure valve (Lo) and completely close its high-pressure valve (Hi).
(High-pressure valve subsequently requires no operation.)

(3) Apply vacuum pumping. Check that the compound pressure gauge reads – 0.1 MPa (– 76 cm Hg).
Evacuation for **at least 1 hour** is recommended.

(4) Close gauge manifold's low-pressure valve (Lo) and stop vacuum pump.
(Leave as is for 4-5 minutes and make sure the coupling meter needle does not go back.
If it does go back, this may indicate the presence of moisture or leaking from connecting parts. Repeat steps 2 – 4 after checking all connecting parts and slightly loosening the nuts.)

(5) Remove covers from liquid shut-off value and gas shut-off valve.

(6) Turn the liquid shut-off valve's rod 90 degrees counterclockwise with a hexagonal wrench to open valve.
Close it after 5 seconds, and check for gas leakage.
Using soapy water, check for gas leakage from indoor unit's flare and outdoor unit's flare and valve rods.
After the check is complete, wipe all soapy water off.

(7) Disconnect charging hose from gas shut-off valve's service port, then fully open liquid and gas shut-off valves.
(Do not attempt to turn valve rod beyond its stop.)

(8) Tighten valve lids and service port caps for the liquid and gas shut-off valves with a torque wrench at the specified torques. See "3 Refrigerant Piping" for details.

Wiring

⚠ WARNING

Do not use tapped wires, stand wires, extensioncords, or starburst connections, as they may cause overheating, electrical shock, or fire.

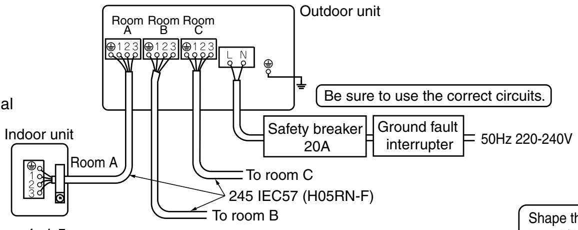
- Do not turn ON the safety breaker until all work is completed.

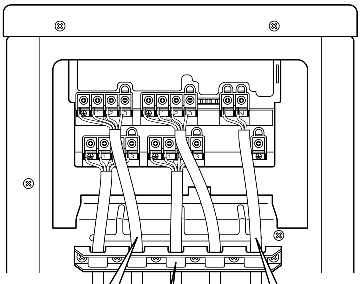
(1) Strip the insulation from the wire (20 mm).

(2) Connect the connection wires between the indoor and outdoor units **so that the terminal numbers match.** Tighten the terminal screws securely. We recommend a flathead screwdriver be used to tighten the screws. The screws are packed with the terminal board.

- Power supply cord : 3×2.5mm^2 or more
- Connecting cord between indoor and outdoor : 4×1.5mm^2

(3) Pull the wire and make sure that it does not disconnect. Then fix the wire in place with a wire stop.



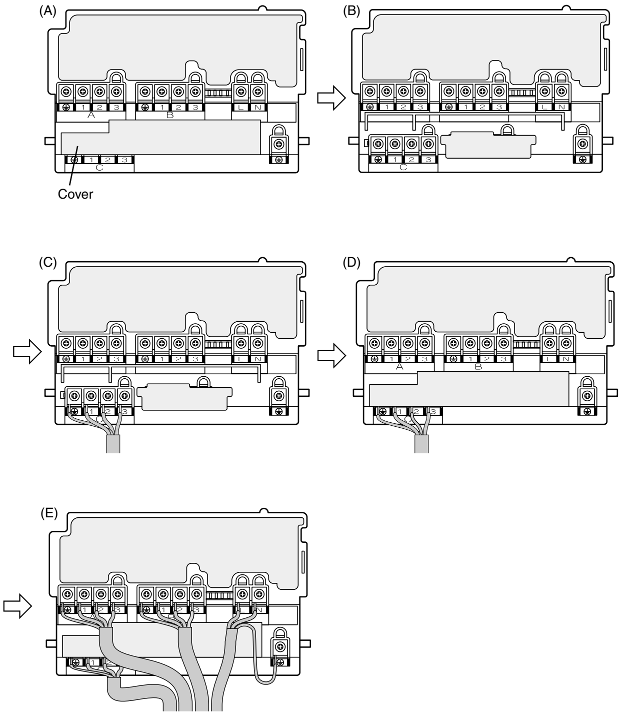


Shape the wires so that there is no lifting of the service hatch or other structural parts.

Use the specified wires and connect them securely.

Secure the branch wiring firmly using **the 4 included screws**, as shown in the figure.
Secure firmly, making sure no outside pressure is exerted on the terminals.

For CU-3E23CBPG, follow the procedure below to connect the wires.



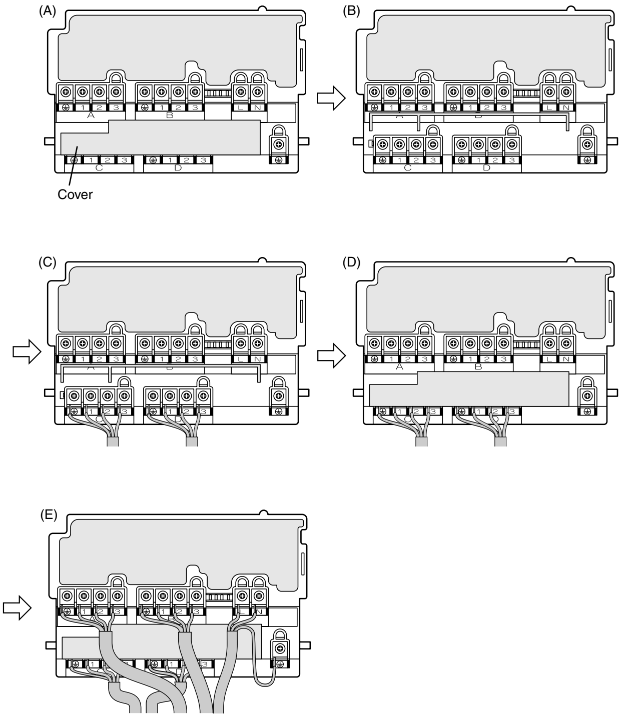
(1) Remove the service lid, and it should be as in Figure (A).
First push up the cover as shown in Figure (B), then connect room C (Figure (C)).
Be sure to connect from room C.

(2) After room C is connected, replace the cover (Figure (D)).

(3) Connect room A, B and power supply wires (Figure (E)).

(4) When connecting the power supply wires to rooms A and B, route the wires so that no force will be applied to the lid, which may otherwise be deformed. (Figure (E))

For CU-4E27CBPG, follow the procedure below to connect the wires. (When connecting 3 or more rooms)



(1) Remove the service lid, and it should be as in Figure (A).
First push up the cover as shown in Figure (B), then connect room C,D (Figure (C)).
Be sure to connect from room C,D.

(2) After room C and D are connected, replace the cover (Figure (D)).

(3) Connect room A, B and power supply wires (Figure (E)).

(4) When connecting the power supply wires to rooms A and B, route the wires so that no force will be applied to the lid, which may otherwise be deformed. (Figure (E))

Earth

This air conditioner must be earthed.
For earthing, follow the applicable local standard for electrical installations.

Test Run and Final Check

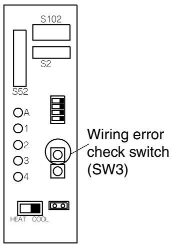
- Before starting the test run, measure the voltage at the primary side of the safety breaker. Check that it is 230V.
- Check that all liquid and gas shut-off valves are fully open.
- Check that piping and wiring all match. The wiring error check can be conveniently used for underground wiring and other wiring that cannot be directly checked.

Wiring error check

- This product is capable of automatic correction of wiring error.

Press the "wiring error check switch" on the outdoor unit service monitor print board. However, the wiring error check switch will not function for one minute after the safety breaker is turned on, or depending on the outside air conditions (See Note 2.).
Approximately 10 – 15 minutes after the switch is pressed, the errors in the connection wiring will be corrected.

Service P-board

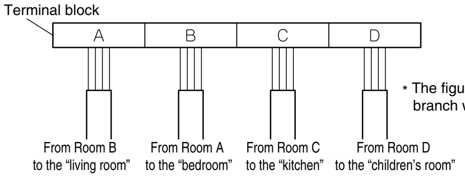


[The service monitor LEDs indicate whether or not correction is possible, as shown in the table below. For details about how to read the LED display, refer to the service guide.]

If self-correction is not possible, check the indoor unit wiring and piping in the usual manner.

LED	1	2	3	4	Message
Status	All Flashing				Automatic correction impossible
	Flashing One after another				Automatic correction completed
	☼ (One or more of LEDs 1 to 4 are ON)				Abnormal stop [Note. 4]

Wiring correct example


Terminal block
A
B
C
D
From Room B to the "living room"
From Room A to the "bedroom"
From Room C to the "kitchen"
From Room D to the "children's room"

* The figure at left shows branch wiring.

⇩ Wiring error check

LED lighting sequence after a wiring correction.

Order of LED flashing: 2 → 1 → 3 → 4

Notes

(1) For two rooms, LED 3 and 4 are not displayed, and for three rooms, LED 4 is not displayed.
(2) If the outside air temperature is 5 °C or less, the wiring error check function will not operate.
(3) After wiring error check operation is completed, LED indication will continue until ordinary operation starts.
This is normal.
(4) Follow the product diagnosis procedures. (Check the nameplate on the underside of the shut-off valve.)

- To test cooling, set for the lowest temperature. To test heating, set for the highest temperature. (Depending on the room temperature, only heating or cooling (but not both) may be possible.)
- After the unit is stopped, it will not start again (heating or cooling) for approximately 3 minutes.
- During the test run, first check the operation of each unit individually. Then also check the simultaneous operation of all indoor units.
  Check both heating and cooling operation.
- After running the unit for approximately 20 minutes, measure the temperatures at the indoor unit inlet and outlet. If the measurements are above the values shown in the table below, then they are normal.

	Cooling	Heating
Temperature difference between inlet and outlet	Approx. 8 °C	Approx. 20 °C

(When running in one room)

- During cooling operation, frost may form on the gas shut-off valve or other parts. This is normal.
- Operate the indoor units in accordance with the included operation manual. Check that they operate normally.

Items to check

Check item	Consequences of trouble	Check
Are the indoor units installed securely?	Falling, vibration, noise	
Has an inspection been made to check for gas leakage?	No cooling, no heating	
Has complete thermal insulation been done (gas pipes, liquid pipes, indoor portions of the drain hose extension)?	Water leakage	
Is the drainage secure?	Water leakage	
Are the ground wire connections secure?	Danger in the event of a ground fault	
Are the electric wires connected correctly?	No cooling, no heating	
Is the wiring in accordance with the specifications?	Operation failure, burning	
Are the inlets/outlets of the indoor and outdoor units free of any obstructions? Are the shut-off valves open?	No cooling, no heating	
Do the marks match (room A, room B) on the wiring and piping for each indoor unit?	No cooling, no heating	
Is the priority room setting set for 2 or more rooms?	The priority room setting will not function.	

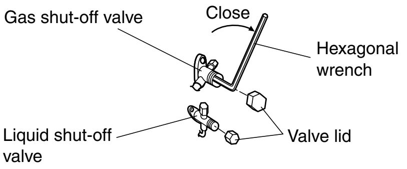
ATTENTION

- Have the customer actually operate the unit while looking at the manual included with the indoor unit. Instruct the customer how to operate the unit correctly (particularly cleaning of the air filters, operation procedures, and temperature adjustment).
- Even when the air conditioner is not operating, it consumes some electric power. If the customer is not going to use the unit soon after it is installed, turn OFF the breaker to avoid wasting electricity.
- If additional refrigerant has been charged because of long piping, list the amount added on the nameplate on the reverse side of the shut-off valve cover.

Pump Down Operation

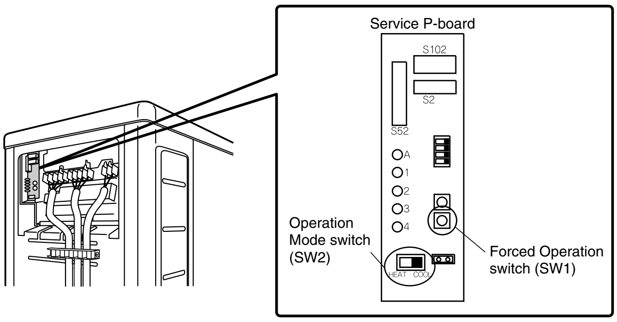
In order to protect the environment, be sure to pump down when relocating or disposing of the unit.

(1) Remove the valve lid from liquid shut-off valve and gas shut-off valve.
(2) Carry out forced cooling operation.
(3) After five to ten minutes, close the liquid shut-off valve with a hexagonal wrench.
(4) After two to three minutes, close the gas shut-off valve and stop forced cooling operation.



Forced operation

(1) Turn the Operation Mode switch (SW2) to "COOL."
(2) Press the Forced Operation switch (SW1) to begin forced cooling. Press the Forced Operation switch (SW1) again to stop forced cooling.

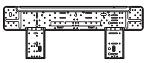
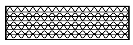
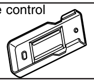
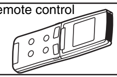
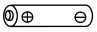
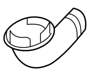
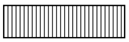


MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
Web Site : http://www.panasonic.co.jp/global/

ENGLISH

PRINTED IN JAPAN

Attached accessories.

No.	Accessories part	Qty.	No.	Accessories part	Qty.
1	Installation plate 	1	6	Solar refreshing deodorizing filter 	1
2	Installation plate fixing screw	6	7	Remote control holder 	1
3	Remote control 	1	8	Remote control holder fixing screw	2
4	Battery 	2	9	Drain elbow 	1
5	Air purifying filter 	1			

Applicable piping kit
CZ-3F5, 7AEN

SELECT THE BEST LOCATION

INDOOR UNIT

- ☐ There should not be any heat source or steam near the unit.
- ☐ There should not be any obstacles blocking the air circulation.
- ☐ A place where air circulation in the room is good.
- ☐ A place where drainage can be easily done.
- ☐ A place where noise prevention is taken into consideration.
- ☐ Do not install the unit near the door way.
- ☐ Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- ☐ Recommended installation height for indoor unit shall be at least 2.3 m.

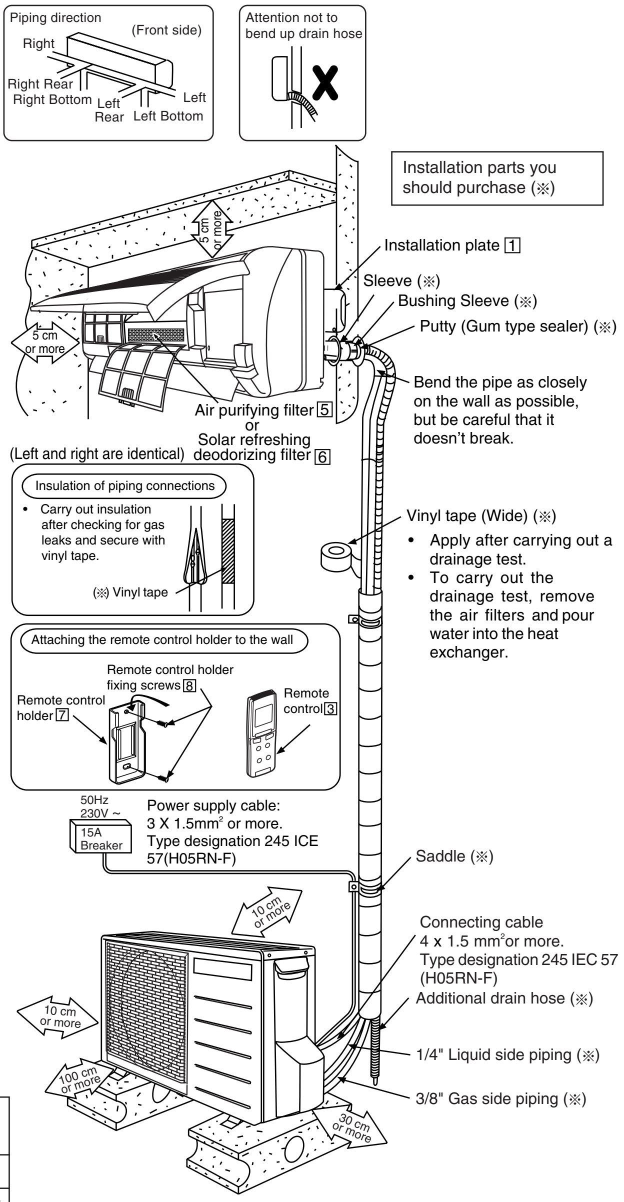
OUTDOOR UNIT

- ☐ If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- ☐ There should not be any animal or plant which could be affected by hot air discharged.
- ☐ Keep the spaces indicated by arrows from wall,ceiling, fence or other obstacles.
- ☐ Do not place any obstacles which may cause a short circuit of the discharged air.
- ☐ If piping length is over the common length, additional refrigerant should be added as shown in the table.

PIPE size		Common Length (m)	Min. Length (m)	Max. total Length (m)	Max. Elevation (m)	Additional gas charge amount (g/m)
Gas	Liquid					
3/8"	1/4"	15	3m/Indoor unit	30	10	20

Note: (1)It is possible to extend the piping length of one unit up to 20 meters. However, the total piping length must not exceed 30 meters.
(2)If the piping length exceeds 20 meters, refrigerant of 20g per meter must be added.

Indoor/Outdoor Unit Installation Diagram


Piping direction
(Front side)
Right
Right Rear
Right Bottom
Left Rear
Left
Left Bottom
Attention not to bend up drain hose
5 cm or more
5 cm or more
(Left and right are identical)
Installation plate 1
Sleeve (※)
Bushing Sleeve (※)
Putty (Gum type sealer) (※)
Air purifying filter 5
or
Solar refreshing deodorizing filter 6
Insulation of piping connections
(※) Vinyl tape
Attaching the remote control holder to the wall
Remote control holder fixing screws 8
Remote control holder 7
Remote control 3
50Hz
230V ~
15A Breaker
Saddle (※)
10 cm or more
10 cm or more
100 cm or more
30 cm or more
Additional drain hose (※)
1/4" Liquid side piping (※)
3/8" Gas side piping (※)

Installation parts you should purchase (※)

Bend the pipe as closely on the wall as possible, but be careful that it doesn’t break.

- Carry out insulation after checking for gas leaks and secure with vinyl tape.

Vinyl tape (Wide) (※)
- Apply after carrying out a drainage test.
- To carry out the drainage test, remove the air filters and pour water into the heat exchanger.

Power supply cable:
3 X 1.5mm^2 or more.
Type designation 245 ICE 57(H05RN-F)

Connecting cable
4 x 1.5 mm^{2}or more.
Type designation 245 IEC 57 (H05RN-F)

- This illustration is for explanation purposes only. The indoor unit will actually face a different way.

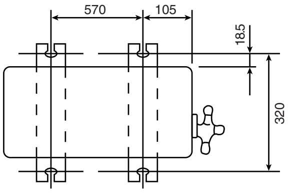
1 SELECT THE BEST LOCATION

(Refer to “Select the best location” section)

2 INSTALL THE OUTDOOR UNIT

- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.

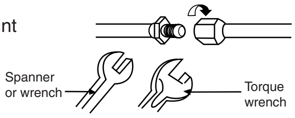
1. Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (ø10 mm).
2. When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.


570
105
18.5
320

3 CONNECTING THE PIPING

Connecting The Piping To Indoor Unit

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe.
(In case of using long piping)


Spanner or wrench
Torque wrench

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.

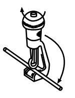
Piping size (Torque)	
Gas	Liquid
3/8" [42 N•m]	1/4" [18 N•m]

Connecting The Piping To Outdoor Unit

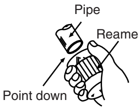
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe.
Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

CUTTING AND FLARING THE PIPING

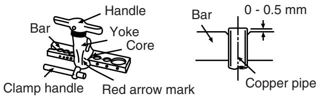
1. Please cut using pipe cutter and then remove the burrs.
2. Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.
   Turn the piping end down to avoid the metal powder entering the pipe.
3. Please make flare after inserting the flare nut onto the copper pipes.



1. To cut

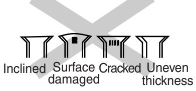

Pipe
Reamer
Point down

2. To remove burrs


Handle
Bar
Yoke
Core
Clamp handle
Red arrow mark
Bar
0 - 0.5 mm
Copper pipe

3. To flare

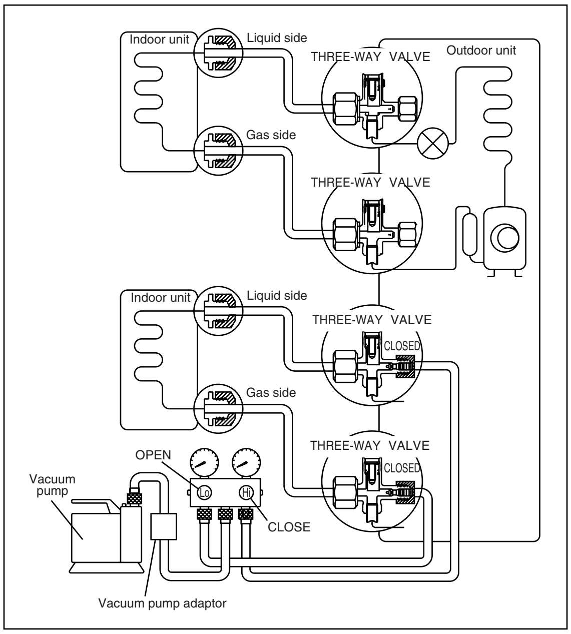
■ Improper flaring ■


Inclined
Surface damaged
Cracked
Uneven thickness

When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

4 EVACUATION OF THE EQUIPMENT (FOR EUROPE & OCEANIA DESTINATION)

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDETHE INDOOR UNIT AND PIPES in the following procedure.



1. Connect a charging hose with a push pin to the Low and High side of a charging set and the service port of the 3-way valves.
   - Be sure to connect the end of the charging hose with the push pin to the service port.
2. Connect the centre hose of the charging set to a vacuum pump with check valve, or vacuum pump and vacuum pump adaptor.
3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg(0 MPa)to – 76 cmHg(–0. 1MPa). Then evacuate the air for approximately 15 minutes.
4. Close the Low and High side valves of the charging set and turn off the vacuum pump.Make sure that the needle in the gauge does not move after approximately 5 minutes.
   Note: BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
5. Disconnect the charging hose from the vacuum pump and from the servise port of the 3-way valves.
6. Tighten the service port caps of the 3-way valves at a torque of 18 N·m with a torque wrench.
7. Remove the valve caps of the both 3-way valves.
   Position both of the valves to "OPEN" using a hexagonal wrench(4mm).
8. Mount valve caps onto the both 3-way valves.
   - Be sure to check for gas leakages.

CAUTION

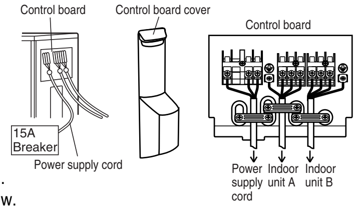
- If gauge needle does not move from 0 cmHg (0 MPa) to –76 cmHg (–0.1 MPa), in step ③ above take the following measure:
- If the leak stops when the piping connections are tightened further, continue working from step ③.
- If the leak does not stop when the connections are retightened, repair the location of leak.
- Do not release refrigerant during piping work for installation and reinstallation. Take care of the liquid refrigerant, it may cause frostbite.

5 CONNECT THE CABLE TO THE OUTDOOR UNIT

1. Remove the control board cover from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 4 x 1.5 mm^2 flexible cord, type designation 245 IEC 57(H05RN-F) or heavier cord.

Terminals on the indoor unit	1	2	3	⏚
Color of wires	░	▒	▓	█
Terminals on the outdoor unit	1	2	3	⏚

3. Secure the cable onto the control board with the holder (clamper).
4. Attach the control board cover in its original position with the screw.

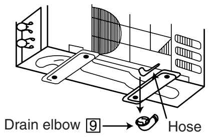


6 PIPE INSULATION

1. Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2. If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

DISPOSAL OF OUTDOOR UNIT DRAIN WATER

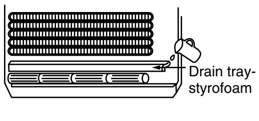
- If a drain elbow is used, the unit should be placed on a stand which is taller than 3 cm.
- If the unit is used in an area where temperature falls below 0°C for 2 or 3 days in succession, it is recommended not to use a drain elbow, for the drain water freezes and the fan will not rotate.



Install the hose at an angle so that the water smoothly flows out.

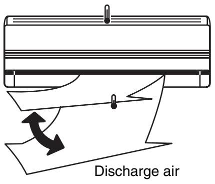
CHECK THE DRAINAGE

- Open front panel and remove air filters. (Drainage checking can be carried out without removing the front grille.)
- Pour a glass of water into the drain tray-styrofoam.
- Ensure that water flows out from drain hose of the indoor unit.



EVALUATION OF THE PERFORMANCE

- Operate the unit at cooling operation mode for fifteen minutes or more.
- Measure the temperature of the intake and discharge air.
- Ensure the difference between the intake temperature and the discharge is more than 8°C.



CHECK ITEMS

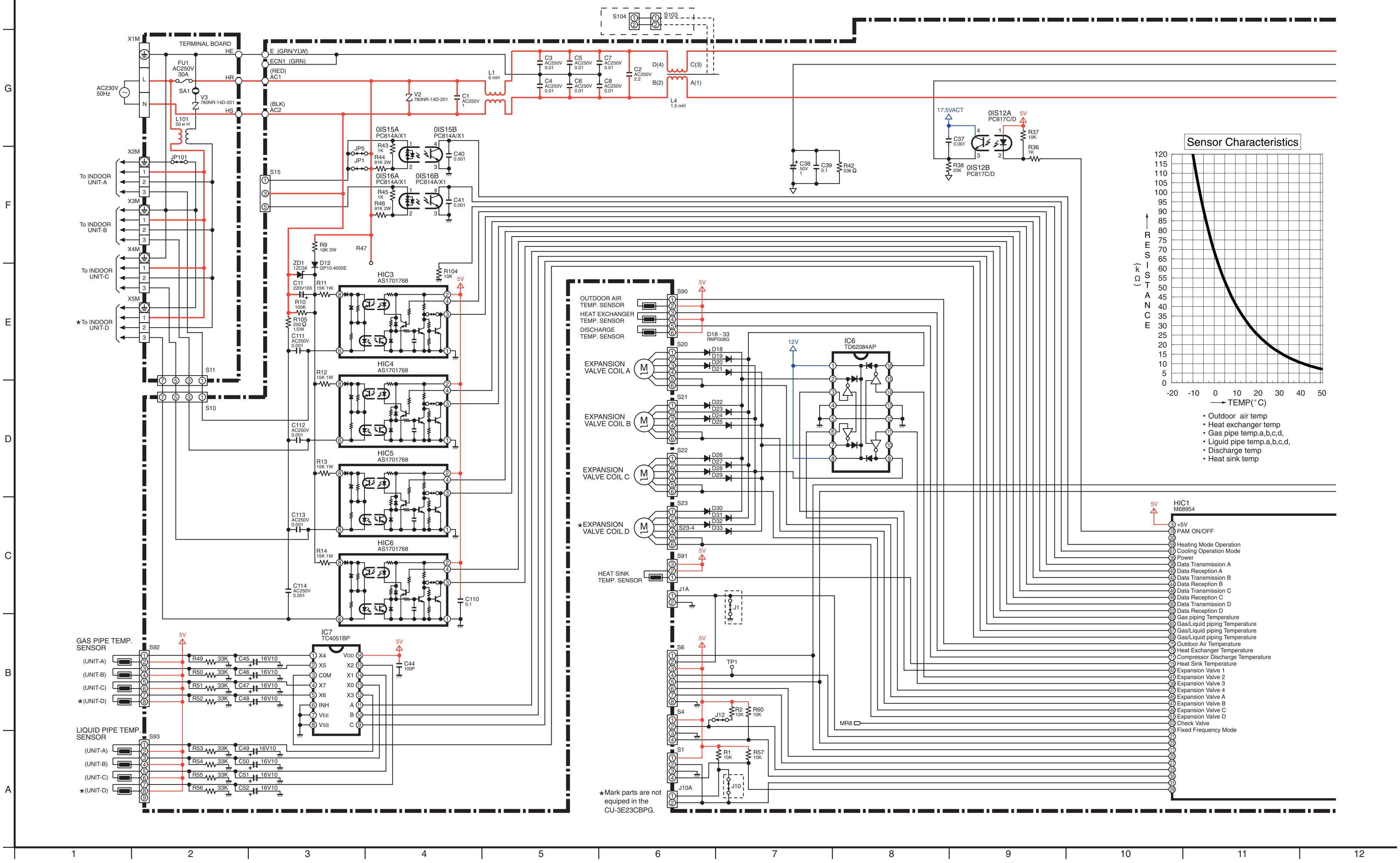
☐ Is there any gas leakage at flare nut connections?
☐ Has the heat insulation been carried out at flare nut connection?
☐ Is the connecting cable being fixed to terminal board firmly?
☐ Is the connecting cable being clamped firmly?
☐ Is the drainage ok? (Refer to "Check the drainage" section)
☐ Is the earth wire connection properly done?
☐ Is the indoor unit properly hooked to the installation plate?
☐ Is the power supply voltage complied with rated value?
☐ Is there any abnormal sound?
☐ Is the cooling operation normal?
☐ Is the thermostat operation normal?
☐ Is the remote control's LCD operation normal?
☐ Is the air purifying filter installed?

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
Web Site : http://www.panasonic.co.jp/global/

ENGLISH

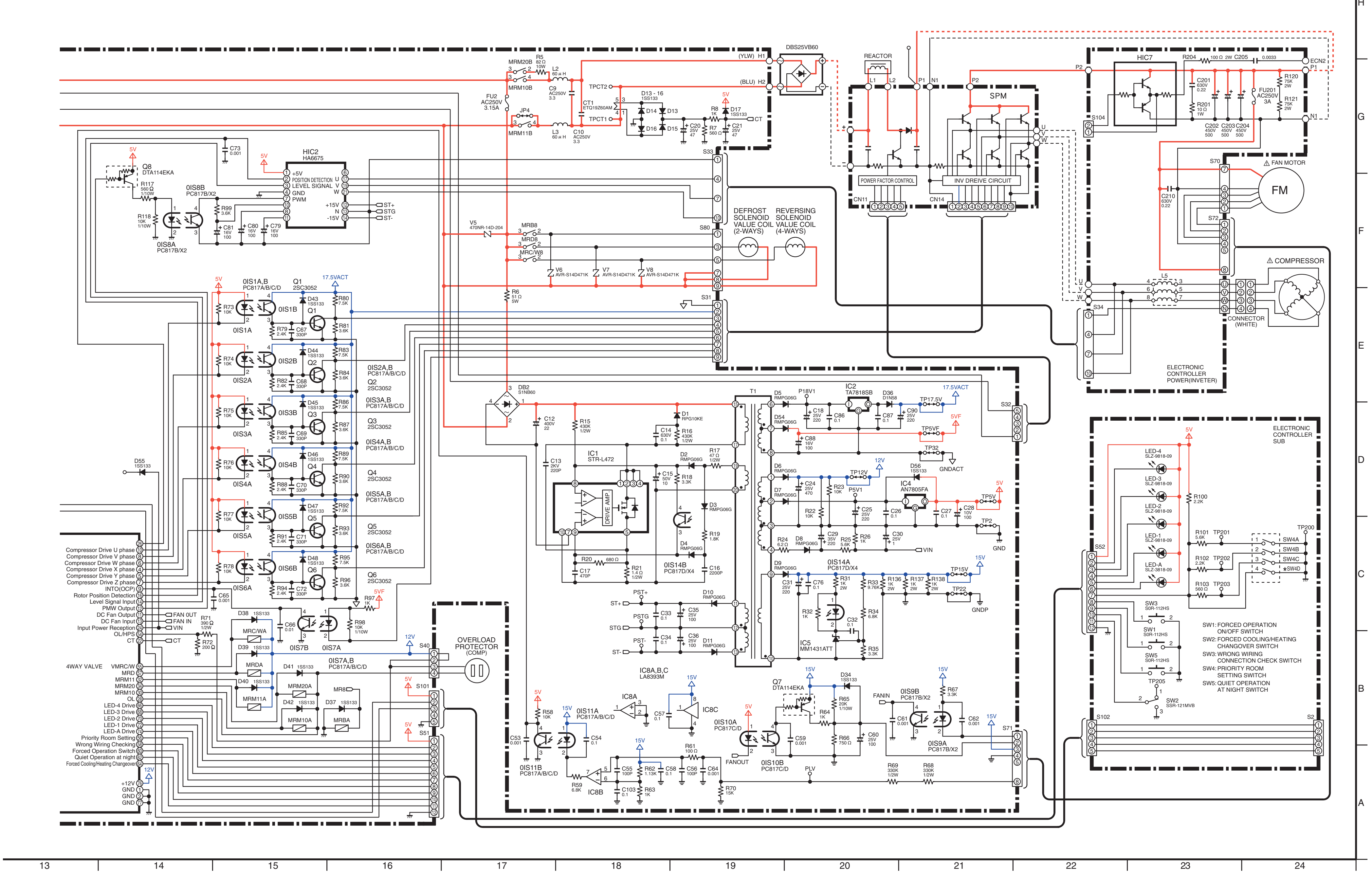
F612314
PRINTED IN JAPAN

3, 4-ROOM OUTDOOR 1/2 CU-3E23CBPG, CU-4E27CBPG


H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
X1M
TERMINAL BOARD
HE
HR
HS
E (GRN/YLW)
ECN1 (GRN)
(RED)
AC1
(BLK)
AC2
FU1
AC250V
30A
SA1
V3
780NR-14D-201
L101
50 μ H
AC230V
50Hz
L
N
X2M
JP101
To INDOOR
UNIT-A
X3M
To INDOOR
UNIT-B
X4M
To INDOOR
UNIT-C
X5M
★To INDOOR
UNIT-D
S11
S10
S15
V2
780NR-14D-201
C1
AC250V
L1
6 mH
C3
AC250V
0.01
C5
AC250V
0.01
C7
AC250V
0.01
C4
AC250V
0.01
C6
AC250V
0.01
C8
AC250V
0.01
C2
AC250V
2.2
D(4)
B(2)
C(3)
A(1)
L4
1.5 mH
S104
S103
0IS15A
PC814A/X1
0IS15B
PC814A/X1
JP5
JP1
R43
1K
R44
91K 2W
C40
0.001
0IS16A
PC814A/X1
0IS16B
PC814A/X1
R45
1K
R46
91K 2W
C41
0.001
R9
18K 2W
R47
ZD1
1ZC56
D12
GP10-4005E
C11
220V100
R10
100K
R105
200 Ω
1/2W
C111
AC250V
0.001
R11
15K 1W
HIC3
AS1701768
R104
10K
5V
R12
15K 1W
HIC4
AS1701768
C112
AC250V
0.001
R13
15K 1W
HIC5
AS1701768
C113
AC250V
0.001
R14
15K 1W
HIC6
AS1701768
C114
AC250V
0.001
C110
0.1
C38
50V
1
C39
0.1
R42
536 Ω
17.5VACT
C37
0.001
R38
20K
0IS12A
PC817C/D
0IS12B
PC817C/D
R37
10K
R36
1K
Sensor Characteristics
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
RESISTANCE (kΩ)
-20
-10
0
10
20
30
40
50
TEMP(°C)
• Outdoor air temp
• Heat exchanger temp
• Gas pipe temp.a,b,c,d,
• Liguid pipe temp.a,b,c,d,
• Discharge temp
• Heat sink temp
S90
OUTDOOR AIR
TEMP. SENSOR
HEAT EXCHANGER
TEMP. SENSOR
DISCHARGE
TEMP. SENSOR
D18 - 33
RMPG06G
S20
EXPANSION
VALVE COIL A
D18
D19
D20
D21
S21
EXPANSION
VALVE COIL B
D22
D23
D24
D25
S22
EXPANSION
VALVE COIL C
D26
D27
D28
D29
S23
★EXPANSION
VALVE COIL D
S23-4
D30
D31
D32
D33
M
12V
IC6
TD62084AP
S91
HEAT SINK
TEMP. SENSOR
J1A
J1
S6
TP1
S4
J12
R2
10K
R60
10K
S1
R1
10K
R57
10K
J10
J10A
MR8
HIC1
M68954
+5V
PAM ON/OFF
Heating Mode Operation
Cooling Operation Mode
Power
Data Transmission A
Data Reception A
Data Transmission B
Data Reception B
Data Transmission C
Data Reception C
Data Transmission D
Data Reception D
Gas piping Temperature
Gas/Liquid piping Temperature
Gas/Liquid piping Temperature
Gas/Liquid piping Temperature
Outdoor Air Temperature
Heat Exchanger Temperature
Compressor Discharge Temperature
Heat Sink Temperature
Expansion Valve 1
Expansion Valve 2
Expansion Valve 3
Expansion Valve 4
Expansion Valve A
Expansion Valve B
Expansion Valve C
Expansion Valve D
Check Valve
Fixed Frequency Mode
GAS PIPE TEMP.
SENSOR
S92
(UNIT-A)
(UNIT-B)
(UNIT-C)
★(UNIT-D)
R49
R50
R51
R52
33K
C45
C46
C47
C48
16V10
IC7
TC4051BP
X4
X5
COM
X7
X6
INH
VEE
VSS
VDD
X2
X1
X0
X3
A
B
C
C44
100P
LIQUID PIPE TEMP.
SENSOR
S93
R53
R54
R55
R56
C49
C50
C51
C52

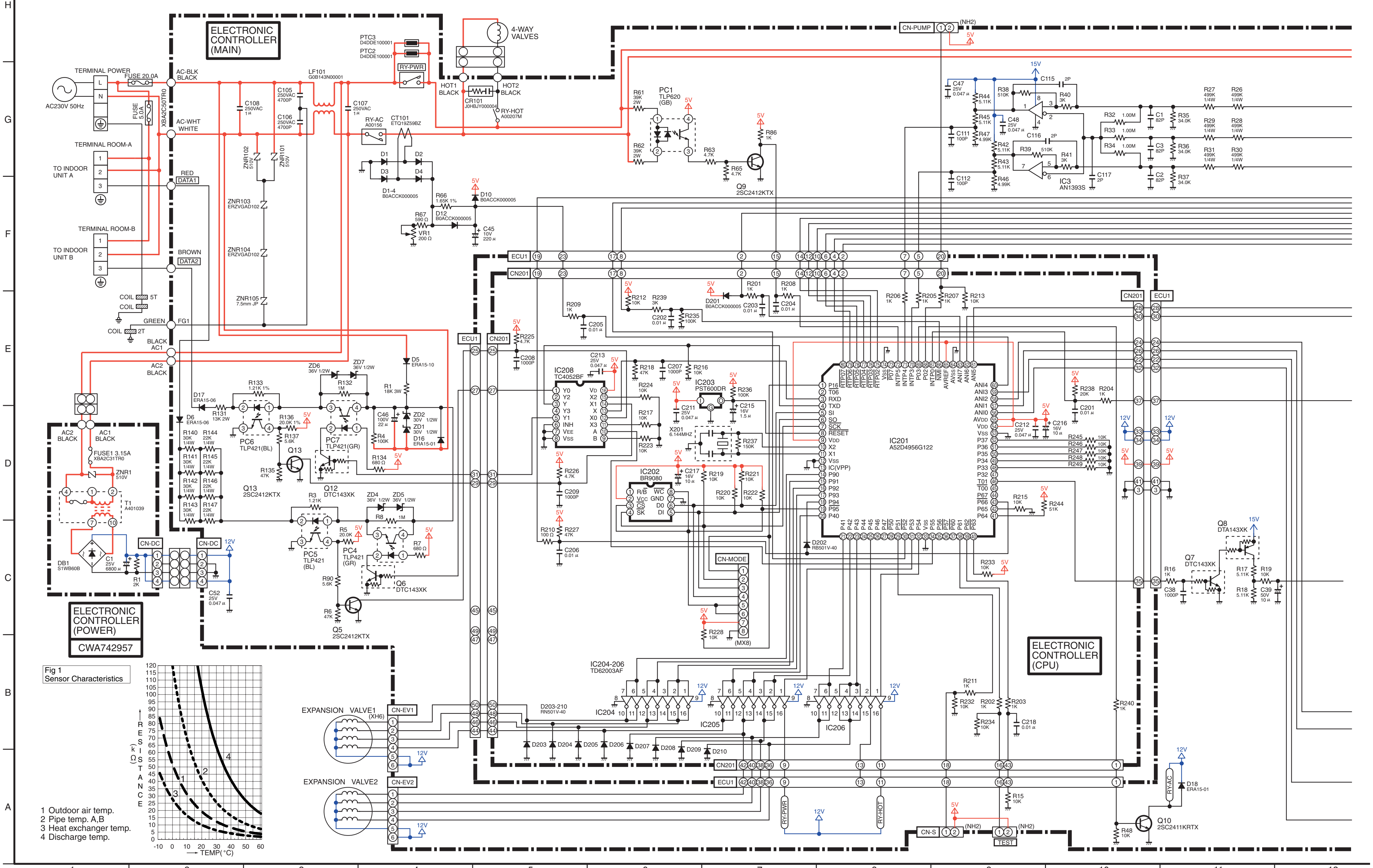
★Mark parts are not equipped in the CU-3E23CBPG.

3, 4-ROOM OUTDOOR 2/2 CU-3E23CBPG, CU-4E27CBPG

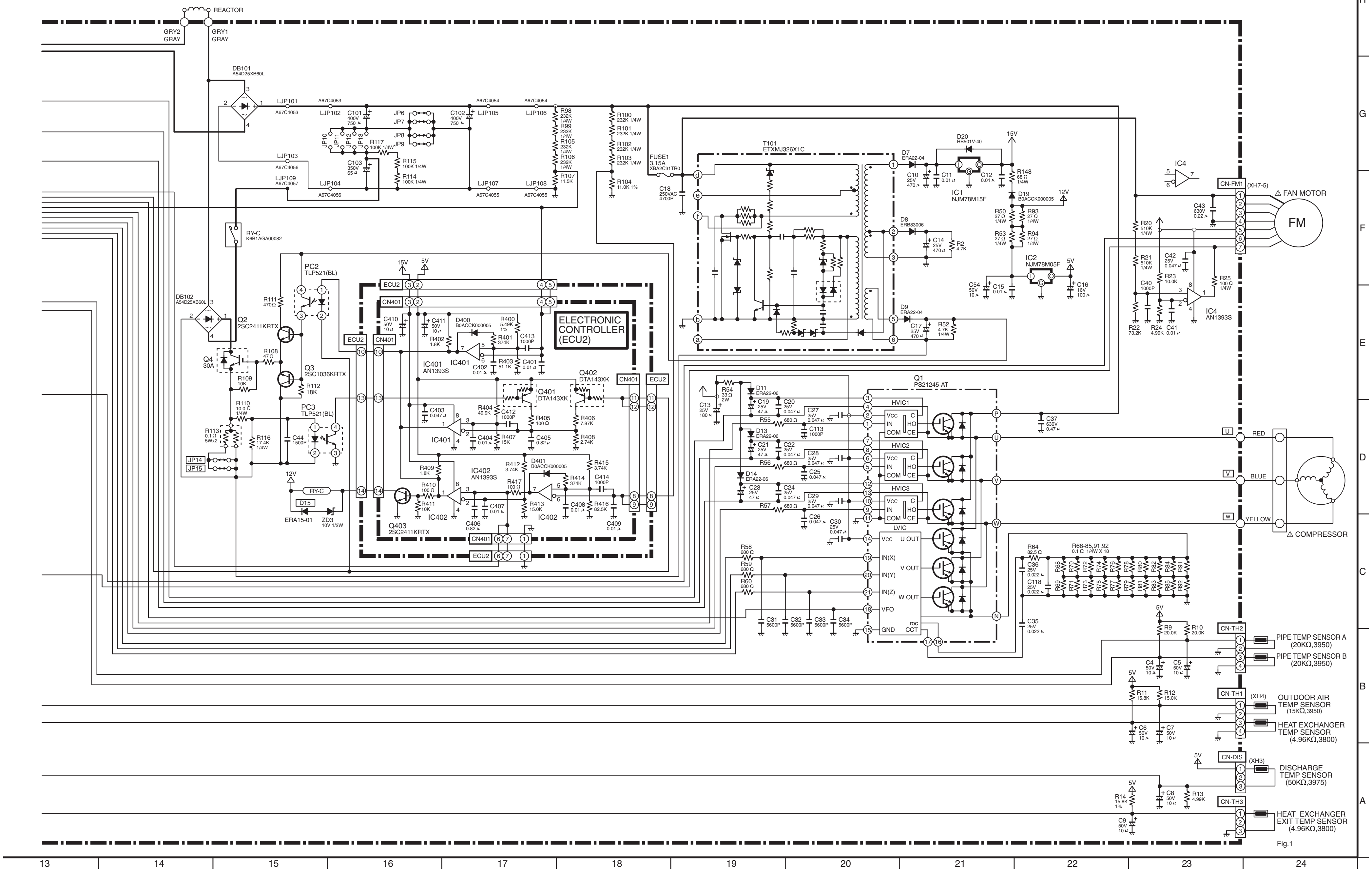


DBS25VB60
REACTOR
SPM
HIC7
ECN2
P1
N1
P2
FU201 AC250V 3A
FAN MOTOR
FM
COMPRESSOR
CONNECTOR (WHITE)
ELECTRONIC CONTROLLER POWER(INVETER)
POWER FACTOR CONTROL
INV DREIVE CIRCUIT
CN11
CN14
S33
S80
S31
S32
S34
S70
S72
S104
HIC2 HA6675
POSITION DETECTION
LEVEL SIGNAL
GND
PWM
Q8 DTA114EKA
0IS8B PC817B/X2
0IS8A PC817B/X2
MRM20B
MRM10B
MRM11B
FU2 AC250V 3.15A
JP4
CT1 ETQ19Z60AM
TPCT2
TPCT1
CT
DEFROST SOLENOID VALUE COIL (2-WAYS)
REVERSING SOLENOID VALUE COIL (4-WAYS)
MRB8
MRD8
MRC/W8
V5 470NR-14D-204
V6 AVR-S14D471K
V7 AVR-S14D471K
V8 AVR-S14D471K
R6 51Ω 5W
0IS1A,B PC817A/B/C/D
Q1 2SC3052
17.5VACT
0IS2A,B PC817A/B/C/D
Q2 2SC3052
0IS3A,B PC817A/B/C/D
Q3 2SC3052
0IS4A,B PC817A/B/C/D
Q4 2SC3052
0IS5A,B PC817A/B/C/D
Q5 2SC3052
0IS6A,B PC817A/B/C/D
Q6 2SC3052
0IS7A,B PC817A/B/C/D
DB2 S1NB60
T1
IC1 STR-L472
DRIVE AMP
IC2 TA7818SB
IC4 AN7805FA
IC5 MM1431ATT
0IS14A PC817D/X4
0IS14B PC817D/X4
TP17.5V
TP5VF
TP32
TP12V
TP5V
TP2
TP15V
TP22
GNDACT
GND
GNDP
VIN
OVERLOAD PROTECTOR (COMP)
S40
S101
S51
IC8A,B,C LA8393M
IC8A
IC8B
IC8C
0IS11A PC817A/B/C/D
0IS11B PC817A/B/C/D
Q7 DTA114EKA
0IS10A PC817C/D
0IS10B PC817C/D
0IS9A PC817B/X2
0IS9B PC817B/X2
FANIN
FANOUT
PLV
S71
MRC/WA
MRDA
MRM11A
MRM20A
MRM10A
MRB
MRBA
Compressor Drive U phase
Compressor Drive V phase
Compressor Drive W phase
Compressor Drive X phase
Compressor Drive Y phase
Compressor Drive Z phase
INTO(OCP)
Rotor Position Detection
Level Signal Input
PMW Output
DC Fan Output
DC Fan Input
Input Power Reception
OL/HPS
CT
FAN OUT
FAN IN
VIN
4WAY VALVE
VMRC/W
MRD
MRM11
MRM20
MRM10
OL
LED-4 Drive
LED-3 Drive
LED-2 Drive
LED-1 Drive
LED-A Drive
Priority Room Setting
Wrong Wiring Checking
Forced Operation Switch
Quiet Operation at night
Forced Cooling/Heating Changeover
+12V
GND
ELECTRONIC CONTROLLER SUB
LED-4 SLZ-9818-09
LED-3 SLZ-9818-09
LED-2 SLZ-9818-09
LED-1 SLZ-9818-09
LED-A SLZ-3818-09
S52
S102
S2
TP200
TP201
TP202
TP203
TP205
SW4A
SW4B
SW4C
SW4D
SW3 S0R-112HS
SW1 S0R-112HS
SW5 S0R-112HS
SW2 SSR-121MVB
SW1: FORCED OPERATION ON/OFF SWITCH
SW2: FORCED COOLING/HEATING CHANGEOVER SWITCH
SW3: WRONG WIRING CONNECTION CHECK SWITCH
SW4: PRIORITY ROOM SETTING SWITCH
SW5: QUIET OPERATION AT NIGHT SWITCH
H
G
F
E
D
C
B
A
13
14
15
16
17
18
19
20
21
22
23
24

2-ROOM OUTDOOR 1/3 CU-2E15CBPG, CU-2E18CBPG


ELECTRONIC CONTROLLER (MAIN)
ELECTRONIC CONTROLLER (POWER)
CWA742957
ELECTRONIC CONTROLLER (CPU)
TERMINAL POWER
AC230V 50Hz
FUSE 20.0A
FUSE 5.0A
TERMINAL ROOM-A
TO INDOOR UNIT A
TERMINAL ROOM-B
TO INDOOR UNIT B
AC-BLK BLACK
AC-WHT WHITE
RED DATA1
BROWN DATA2
GREEN FG1
COIL 5T
COIL 2T
AC1 BLACK
AC2 BLACK
LF101 G0B143N00001
PTC3 D4DDE100001
PTC2 D4DDE100001
RY-PWR
RY-AC A00156
CT101 ETQ19Z59BZ
4-WAY VALVES
HOT1 BLACK
HOT2 BLACK
CR101
RY-HOT A00207M
PC1 TLP620 (GB)
Q9 2SC2412KTX
IC3 AN1393S
CN-PUMP
(NH2)
ECU1
CN201
IC201 A52D4956G122
IC208 TC4052BF
IC203 PST600DR
IC202 BR9080
X201 6.144MHZ
CN-MODE
(MX8)
IC204-206 TD62003AF
IC204
IC205
IC206
D203-210 RN501V-40
EXPANSION VALVE1
(XH6)
CN-EV1
EXPANSION VALVE2
CN-EV2
CN-DC
CN-S
TEST
RY-PWR
RY-HOT
RY-AC
Q10 2SC2411KRTX
Q8 DTA143XK
Q7 DTC143XK
PC6 TLP421(BL)
PC7 TLP421(GR)
PC5 TLP421 (BL)
PC4 TLP421 (GR)
Q13 2SC2412KTX
Q12 DTC143XK
Q6 DTC143XK
Q5 2SC2412KTX
FUSE1 3.15A XBA2C31TR0
ZNR1 510V
T1 A401039
DB1 S1WB60B
5V
12V
15V
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
Fig 1
Sensor Characteristics
RESISTANCE (kΩ)
TEMP (°C)
1 Outdoor air temp.
2 Pipe temp. A,B
3 Heat exchanger temp.
4 Discharge temp.

2-ROOM OUTDOOR 2/3 CU-2E15CBPG, CU-2E18CBPG



REACTOR
GRY2 GRAY
GRY1 GRAY
DB101 A54D25XB60L
LJP101 A67C4053
LJP102
C101 400V 750 µ
JP6
JP7
JP8
JP9
JP10
JP11
JP12
JP13
R117 100K 1/4W
C102 400V 750 µ
LJP105
LJP106
A67C4054
R98 232K 1/4W
R99 232K 1/4W
R105 232K 1/4W
R106 232K 1/4W
R107 11.5K
R100 232K 1/4W
R101 232K 1/4W
R102 232K 1/4W
R103 232K 1/4W
R104 11.0K 1%
LJP103 A67C4056
C103 350V 65 µ
R115 100K 1/4W
R114 100K 1/4W
LJP109 A67C4057
LJP104 A67C4056
LJP107 A67C4055
LJP108 A67C4055
RY-C K6B1AGA00082
FUSE1 3.15A XBA2C31TR0
C18 250VAC 4700P
T101 ETXMJ326X1C
D7 ERA22-04
D20 RB501V-40
15V
C10 25V 470 µ
C11 0.01 µ
C12 0.01 µ
IC1 NJM78M15F
R148 68 Ω 1/4W
D19 B0ACCK000005
12V
R50 27 Ω 1/4W
R93 27 Ω 1/4W
R53 27 Ω 1/4W
R94 27 Ω 1/4W
D8 ERB83006
C14 25V 470 µ
R2 4.7K
IC2 NJM78M05F
5V
C54 50V 10 µ
C15 0.01 µ
C16 16V 100 µ
D9 ERA22-04
C17 25V 470 µ
R52 4.7K 1/4W
IC4
CN-FM1 (XH7-5)
FAN MOTOR
FM
C43 630V 0.22 µ
R20 510K 1/4W
R21 510K 1/4W
C42 25V 0.047 µ
R23 10.0K
R25 100 Ω 1/4W
C40 1000P
IC4 AN1393S
R22 73.2K
R24 4.99K
C41 0.01 µ
PC2 TLP521(BL)
R111 470 Ω
DB102 A54D25XB60L
Q2 2SC2411KRTX
Q4 30A
R108 47 Ω
Q3 2SC1036KRTX
R109 10K
R112 18K
R110 10.0 Ω 1/4W
R113 0.1 Ω 5Wx2
R116 17.4K 1/4W
C44 1500P
PC3 TLP521(BL)
JP14
JP15
12V
RY-C
D15
ERA15-01
ZD3 10V 1/2W
15V
5V
ECU2
CN401
ELECTRONIC CONTROLLER (ECU2)
C410 50V 10 µ
C411 50V 10 µ
D400 B0ACCK000005
R400 5.49K 1%
R402 1.8K
R401 374K
C413 1000P
IC401 AN1393S
IC401
R403 51.1K
C401 0.01 µ
C402 0.01 µ
Q402 DTA143XK
Q401 DTA143XK
C403 0.047 µ
R404 49.9K
C412 1000P
R405 100 Ω
R406 7.87K
C404 0.01 µ
R407 15K
C405 0.82 µ
R408 2.74K
R409 1.8K
IC402 AN1393S
R412 3.74K
D401 B0ACCK000005
R415 3.74K
R414 374K
C414 1000P
R410 100 Ω
R411 10K
R417 100 Ω
C407 0.01 µ
R413 15.0K
C408 0.01 µ
R416 82.5K
C406 0.82 µ
C409 0.01 µ
Q403 2SC2411KRTX
IC402
Q1 PS21245-AT
C13 25V 180 µ
R54 33 Ω 2W
D11 ERA22-06
C19 25V 47 µ
C20 25V 0.047 µ
C27 25V 0.047 µ
R55 680 Ω
C113 1000P
D13 ERA22-06
C21 25V 47 µ
C22 25V 0.047 µ
C28 25V 0.047 µ
R56 680 Ω
C25 0.047 µ
D14 ERA22-06
C23 25V 47 µ
C24 25V 0.047 µ
C29 25V 0.047 µ
R57 680 Ω
C26 0.047 µ
C30 25V 0.047 µ
HVIC1
HVIC2
HVIC3
VCC
IN
COM
C
HO
CE
LVIC
VCC
U OUT
V OUT
W OUT
IN(X)
IN(Y)
IN(Z)
VFO
GND
roc
CCT
R58 680 Ω
R59 680 Ω
R60 680 Ω
C31 5600P
C32 5600P
C33 5600P
C34 5600P
P
U
V
W
N
C37 630V 0.47 µ
RED
BLUE
YELLOW
COMPRESSOR
R64 82.5 Ω
R68-85,91,92 0.1 Ω 1/4W X 18
C36 25V 0.022 µ
C118 25V 0.022 µ
C35 25V 0.022 µ
R68
R69
R70
R71
R72
R73
R74
R75
R76
R77
R78
R79
R80
R81
R82
R83
R84
R85
R91
R92
5V
R9 20.0K
R10 20.0K
CN-TH2
PIPE TEMP SENSOR A (20KΩ,3950)
PIPE TEMP SENSOR B (20KΩ,3950)
C4 50V 10 µ
C5 50V 10 µ
5V
R11 15.8K
R12 15.0K
CN-TH1
(XH4)
OUTDOOR AIR TEMP SENSOR (15KΩ,3950)
HEAT EXCHANGER TEMP SENSOR (4.96KΩ,3800)
C6 50V 10 µ
C7 50V 10 µ
5V
CN-DIS
(XH3)
DISCHARGE TEMP SENSOR (50KΩ,3975)
5V
R14 15.8K 1%
C8 50V 10 µ
R13 4.99K
CN-TH3
HEAT EXCHANGER EXIT TEMP SENSOR (4.96KΩ,3800)
C9 50V 10 µ
H
G
F
E
D
C
B
A
13
14
15
16
17
18
19
20
21
22
23
24

Fig.1

2-ROOM OUTDOOR 3/3

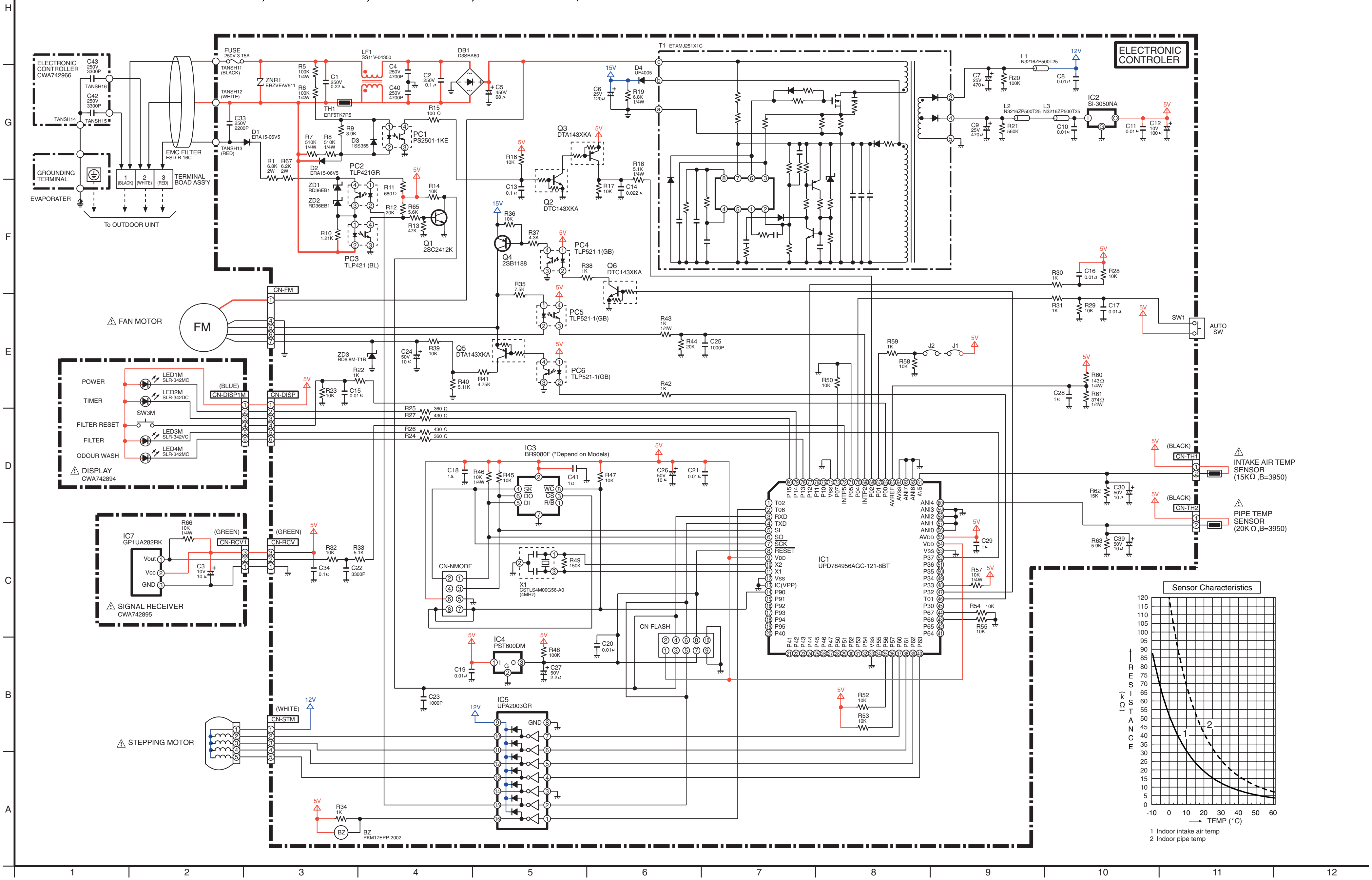
Timer Table

Outdoor		
Function	Time	Test mode
First deice operation time	60 min.	6 sec.
Deice operation starting	45 sec.	4.5 sec.
Deice forced completion	10 min. 30 sec.	63 sec.
Deice operation completion	59 sec.	5.9 sec.
Deice detection	40 min.	8 sec.
	80 min.	16 sec.
	120 min.	24 sec.
Compressor forced operation time	30 sec.	0
Compressor operation frequency step up	60 sec.	0
Deice operation starting 3 degrees C	3 min.	1.8 sec.
DC peak detection after compressor restart	30 sec.	0

Outdoor IC201

Microprocessor A52D4956G122					
Pin No.	Port No.	Description	Pin No.	Port No.	Description
1	P16	+5V	41	P64	
2	$\overline{\text{T06}}$		42	P65	
3	RXD	Data Reception	43	$\overline{\text{P66}}$	PFC Abnormality Detection
4	TXD	Data Transmission	44	P67	
5	SI		45	$\overline{\text{TO0}}$	
6	SO		46	TO1	Fan Speed Control
7	$\overline{\text{SCK}}$		47	P32	
8	$\overline{\text{RESET}}$	Reset Signal	48	P33	
9	Vdd	+5V	49	P34	
10	X2	6MHz Oscillation	50	P35	
11	X1	6MHz Oscillation	51	P36	
12	Vss	GND	52	P37	
13	IC(VPP)		53	Vss	
14	P90	Expansion Valve 1 Drive	54	Vdd	
15	P91	Expansion Valve 1 Drive	55	AVDD	+ 5V
16	P92	Expansion Valve 1 Drive	56	ANI0	Heat Exchanger Exit Temperature
17	P93	Expansion Valve 1 Drive	57	ANI1	Heat Exchanger Temperature
18	P94	PFC	58	ANI2	Outdoor Air Temperature
19	P95		59	ANI3	Compressor Discharge Temperature
20	P40	Expansion Valve 2 Drive	60	ANI4	Running Current
21	P41	Expansion Valve 2 Drive	61	ANI5	Pipe Temperature A
22	P42	Expansion Valve 2 Drive	62	ANI6	Pipe Temperature B
23	P43	Expansion Valve 2 Drive	63	ANI7	DC Voltage
24	P44		64	AVSS	
25	P45		65	AVREF	
26	P46		66	$\overline{\text{NMI}}$	DC Peak Detection
27	P47		67	INTP0	Fan Speed Detection
28	$\overline{\text{P50}}$	LED 201 Drive	68	PO2	Pump Down
29	P51	Terminal for servicing	69	PO3	Ry-AC Drive
30	$\overline{\text{P52}}$	PFC Drive	70	INTP3	Compressor Revolution Detection
31	P53	RY-PWR Drive	71	INTP4	Compressor Revolution Detection
32	P54	RY-HOT Drive	72	INTP5	Clock Pulse
33	Vss	GND 73 PO7	73	PO7	
34	P55	Data	74	Vss	
35	P56		75	$\overline{\text{RTPO2}}$	Compressor Drive U
36	P57	LED 202 Drive	76	$\overline{\text{RTPO3}}$	Compressor Drive V
37	P60	LED 203 Drive	77	$\overline{\text{RTPO4}}$	Compressor Drive W
38	P61	Test (Timer shorten)	78	$\overline{\text{RTPO5}}$	Compressor Drive U
39	P62		79	$\overline{\text{RTPO6}}$	Compressor Drive V
40	$\overline{\text{P63}}$		80	$\overline{\text{RTPO7}}$	Compressor Drive W

INDOOR 1/2 CS-ME7CKPG, CS-ME10CKPG, CS-ME12CKPG, CS-ME14CKPG, CS-ME18CKPG



H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
ELECTRONIC CONTROLLER CWA742966
C43 250V 3300P
TANSH16
C42 250V 3300P
TANSH14
TANSH15
GROUNDING TERMINAL
EVAPORATOR
EMC FILTER ESD-R-16C
TERMINAL BOAD ASS'Y
1 (BLACK)
2 (WHITE)
3 (RED)
To OUTDOOR UINT
FUSE 250V 3.15A
TANSH11 (BLACK)
TANSH12 (WHITE)
TANSH13 (RED)
ZNR1 ERZVEAV511
R5 100K 1/4W
R6 100K 1/4W
C1 250V 0.22 µ
C33 250V 2200P
TH1 ERF5TK7R5
LF1 SS11V-04350
C4 250V 4700P
C40 250V 4700P
C2 250V 0.1 µ
DB1 D3SBA60
C5 450V 68 µ
R15 100 Ω
D1 ERA15-06V5
R7 510K 1/4W
R8 510K 1/4W
R9 3.9K
D3 1SS355
PC1 PS2501-1KE
R1 6.8K 2W
R67 6.2K 2W
D2 ERA15-06V5
PC2 TLP421GR
ZD1 RD36EB1
ZD2 RD36EB1
R11 680 Ω
R12 20K
R14 10K
R65 5.6K
R13 47K
Q1 2SC2412K
R10 1.21K
PC3 TLP421 (BL)
T1 ETXMJ251X1C
15V
D4 UF4005
C6 25V 120 µ
R19 6.8K 1/4W
R16 10K
5V
Q3 DTA143XKA
R18 5.1K 1/4W
C13 0.1 µ
R17 10K
C14 0.022 µ
Q2 DTC143XKA
R36 10K
R37 4.3K
Q4 2SB1188
PC4 TLP521-1(GB)
R38 1K
Q6 DTC143XKA
R35 7.5K
PC5 TLP521-1(GB)
R43 1K 1/4W
R44 20K
C25 1000P
ZD3 RD6.8M-T1B
C24 50V 10 µ
R39 10K
Q5 DTA143XKA
R40 5.11K
R41 4.75K
PC6 TLP521-1(GB)
R42 1K
L1 N3216ZP500T25
12V
C7 25V 470 µ
R20 100K
C8 0.01 µ
ELECTRONIC CONTROLER
L2 N3216ZP500T25
L3 N3216ZP500T25
IC2 SI-3050NA
C9 25V 470 µ
R21 560K
C10 0.01 µ
C11 0.01 µ
C12 10V 100 µ
R30 1K
C16 0.01 µ
R28 10K
R31 1K
R29 10K
C17 0.01 µ
SW1
AUTO SW
R59 1K
J2
J1
R58 10K
R50 10K
R60 143 Ω 1/4W
R61 374 Ω 1/4W
C28 1 µ
CN-FM
FAN MOTOR
FM
POWER
TIMER
FILTER RESET
FILTER
ODOUR WASH
LED1M SLR-342MC
LED2M SLR-342DC
SW3M
LED3M SLR-342VC
LED4M SLR-342MC
(BLUE)
CN-DISP1M
CN-DISP
DISPLAY CWA742894
R22 1K
R23 10K
C15 0.01 µ
R25 360 Ω
R27 430 Ω
R26 430 Ω
R24 360 Ω
IC3 BR9080F (*Depend on Models)
C18 1 µ
R46 10K 1/4W
R45 10K
C41 1 µ
R47 10K
C26 50V 10 µ
C21 0.01 µ
SK
DO
DI
WC
CS
R/B
IC7 GP1UA282RK
R66 10K 1/4W
(GREEN)
CN-RCV1
CN-RCV
Vout
Vcc
GND
C3 10V 10 µ
R32 10K
R33 5.1K
C34 0.1 µ
C22 3300P
SIGNAL RECEIVER CWA742895
CN-NMODE
X1 CSTLS4M00G56-A0 (4MHz)
R49 150K
C20 0.01 µ
CN-FLASH
IC4 PST600DM
R48 100K
C19 0.01 µ
C27 50V 2.2 µ
C23 1000P
IC5 UPA2003GR
GND
(WHITE)
CN-STM
STEPPING MOTOR
R34 1K
BZ
BZ PKM17EPP-2002
IC1 UPD784956AGC-121-8BT
T02
T06
RXD
TXD
SI
SO
SCK
RESET
VDD
X2
X1
VSS
IC(VPP)
P90
P91
P92
P93
P94
P95
P40
P15
P14
P13
P12
P11
P10
VSS
P07
INTP5
P05
P04
INTP2
P02
P01
P00
AVREF
AVSS
ANI7
ANI6
ANI5
ANI4
ANI3
ANI2
ANI1
ANI0
AVDD
VDD
VSS
P37
P36
P35
P34
P33
P32
T01
P30
P67
P66
P65
P64
P41
P42
P43
P44
P45
P46
P47
P50
P51
P52
P53
P54
P55
P56
P57
P60
P61
P62
P63
C29 1 µ
R57 10K 1/4W
R54 10K
R55 10K
R52 10K
R53 10K
(BLACK)
CN-TH1
INTAKE AIR TEMP SENSOR (15KΩ ,B=3950)
R62 15K
C30 50V 10 µ
CN-TH2
PIPE TEMP SENSOR (20K Ω ,B=3950)
R63 5.9K
C39 50V 10 µ
Sensor Characteristics
RESISTANCE (kΩ)
TEMP (°C)
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-10
0
10
20
30
40
50
60
1
2
1 Indoor intake air temp
2 Indoor pipe temp

INDOOR 2/2

Timer Table

Indoor

Function	Time	Test mode
24 hours OFF/ON timer	1 hour	1 min.
Cooling FC max	30 min.	3 sec.
Hot start forced completion	7 min.	0
Hot start forced completion after deice	3 min.	18 sec.
Auto mode judgment sampling time	180 min.	18 sec.
	30 sec.	0
Sleep mode timer shift	60 min.	6 sec.
	120 min.	12 sec.
	180 min.	18 sec.
	300 min.	30 sec.
	420 min.	42 sec.
Thermo off timer	3 min.	18 sec.
Powerful mode operation time count	30 min.	0
Anti-dew formation control	20 min.	0
Anti-freezing control	6 min.	0

IC1

Microprocessor UPD784956GC-121-8BT

Pin No.	Port No.	Description	Pin No.	Port No.	Description
1	TO2		41	P64	
2	TO6	Buzzer Drive	42	P65	
3	RXD	Data Reception	43	P66	
4	TXD	Transmission	44	P67	
5	SI		45	P30	
6	SO		46	TD1	Fan Speed Control
7	$\overline{\text{SCK}}$		47	P32	Fan Motor ON/OFF 15V
8	$\overline{\text{RESET}}$	Reset Signal	48	P33	+ 5V
9	Vdd	+ 5V	49	P34	
10	X2	4MHz Oscillation	50	P35	
11	X1	14MHz Oscillation	51	P36	
12	Vss	GND	52	P37	Display Filter
13	IC(VPP)	GND	53	Vss	GND
14	P90	Data	54	Vdd	+ 5V
15	P91		55	AVdd	+ 5V
16	P92		56	ANI0	
17	P93		57	ANI1	
18	P94		58	ANI2	
19	P95		59	1ANI3	
20	P40		60	ANI4	Pipe Temperature
21	P41		61	ANI5	Intake Air Temperature
22	P42		62	ANI6	
23	P43		63	ANI7	
24	P44		64	AVSS	
25	P45		65	AVREF	Power
26	P46		66	P00	Filter Reset
27	P47		67	P01	Test
28	P50		68	P02	Clock Pulse
29	P51		69	INTP2	Fan Speed Detection
30	P52		70	P04	Auto Switch
31	P53		71	P05	
32	P54		72	INTP5	Remote Control Signal
33	Vss	GND	73	P07	
34	P55		74	Vss	GND
35	P56		75	P10	
36	P57		76	P11	
37	P60	Stepping Motor	77	P12	
38	P61	Stepping Motor	78	P13	Display Odour Wash
39	P62	Stepping Motor	79	P14	Display Power
40	P63	Stepping Motor	80	P15	Display Timer